

Habitat requirements may vary somewhat with life stage and season (USFWS 1995). LCT primarily feed on terrestrial and aquatic invertebrates, although larger fish may be piscivorous (fish eating).

The decline of LCT has been primarily attributed to the loss and degradation of habitat. Agricultural and municipal uses of water from streams or lakes have reduced or altered the stream discharge in habitat for this species. Livestock and wild horse grazing have altered the physical characteristics of stream channels and increased the sediment loads in many LCT streams. Mining, urban development, logging, road construction, and dam building have also been associated with changes in stream channel morphology and water quality (USFWS 1995; NDOW 2004).

LCT compete with or are displaced by nonnative trout species that were historically stocked for recreational fishing opportunities. Dunham and Vinyard (1996) found that the distribution of LCT can be truncated when brook trout are present, although they noted that the results were variable. Furthermore, LCT have hybridized with nonnative rainbow trout in many areas (USFWS 1995; NDOW 2004).

LCT conservation efforts are ongoing and involve fish transplants, population and habitat surveys, genetic evaluations, habitat improvement projects, new grazing practices, use of riparian fencing, and the creation of fishery management plans for several basins. The objective of these management efforts is the protection or restoration of habitats that sustain viable self-sustaining populations of this species. A self-sustaining population is defined as having been established five or more years and having three or more age classes (USFWS 1995).

The USFWS has recommended an ecosystem management approach for the conservation of this species with a streamside management zone that includes the green line and riparian areas (USFWS 1995). Even in areas where LCT populations have declined, annual year class production is highly variable and the species has the capability of responding to improved environmental conditions with rapid increases in abundance (Platts and Nelson 1983; 1988). Site-specific opportunities may exist to improve the status of LCT, including mitigation for permitted land use activities (NDOW 2004).

Status within the Pine Creek Subbasin

The Pine Creek subbasin contains two creeks, Birch Creek and Pete Hanson Creek, with LCT occupying approximately five miles of habitat (NDOW 2004) (Figure 3.23.4). These creeks are isolated occupied streams as identified by the NDOW (i.e., LCT is present in these isolated stream segments of larger river systems with no opportunity for natural recolonization) (USFWS 1995). Both Birch Creek and Pete Hanson Creek currently support LCT (NDOW 2009a). Birch Creek is located on the northeastern flank of Western Peak approximately 10.5 miles northwest of the Project. Pete Hanson Creek is located on the northwest side of Roberts Mountains approximately eight miles northwest of the Project. In the summer of 2011, the NDOW located a population of LCT in Willow Creek which is located east of Birch Creek and northeast of the Project Area (Personal Communication, Ryan Sandefur, September 23, 2011).

Birch Creek originates from the north side of Cooper Peak at approximately 8,200 feet amsl in the Roberts Mountains from four separate springs along three different reaches. Birch Creek flows north until it reaches the valley floor at 6,400 feet amsl where it is diverted for agriculture.

The first fish population survey was conducted in 1957 and subsequent surveys occurred in 1984, 1998, 2003 (NDOW 2003a), and 2009 (NDOW 2009a). During the 1957 survey, two stations were electroshocked and what was believed to be cutthroat trout/rainbow trout (*Oncorhynchus mykiss*) hybrids were found at an average population of 95.9 fish per mile. The stream had last been stocked with trout in 1952; however, the numbers and species were not reported. An intensive habitat and fish population survey conducted in 1984 found what was thought to be cutthroat trout/rainbow trout hybrids at four stations (191.4 fish per mile average) and rainbow trout at two stations (184.8 fish per mile average). Four age classes were represented in the hybrid sample while three age classes were found in the rainbow trout sample; however, post-1984 genetic sampling found those hybrids to be pure LCT (NDOW 2009a).

Both of these surveys questioned whether the fish sampled were actually hybrids. The origin of LCT found in Birch Creek is not known. In 1988 ten fish were sampled and collected for biochemical genetic analysis. The sample found that the fish were pure LCT (Bartley and Gall 1989). It is not known if the fish were stocked in the early 1900s or if the fish are descendants from cutthroat trout native to the Pine Creek drainage. Further, in 2003, LCT from Birch Creek were sampled to identify the probable origin of transplanted populations and to assess the degree of introgression in other populations. Phylogenetic analysis of Birch Creek LCT found that they clustered most closely with East Fork Carson River populations (Peacock 2003). Peacock (2003) also noted evidence of multiple source populations and significant genetic barriers in the Birch Creek population of LCT; however, Peacock also states that sampling is incomplete and phylogenetic relationships can easily be influenced by incomplete sampling.

In 1998, LCT occupied approximately 1.5 miles of Birch Creek with an average population of 153.2 fish per mile. The ratio of adult to sub-adult was 26 percent to 74 percent. The total population including young-of-year was 229.9 and the fish caught ranged from fair to excellent body condition (NDOW 2009b).

The NDOW (2003a) reported that the 2003 electrofishing survey was comparable to the 1984 and 1998 surveys for occupied habitat (1.5 miles), number of age classes (three age classes), and ratio of adult to sub-adult (46.7 percent/53.3 percent). Ocular estimation of habitat conditions on the survey ranged from fair to excellent with the lack of quality pools and cemented substrate being limiting factors (NDOW 2003a). In 2003, LCT had an average population of 198.0 fish per mile (NDOW 2009a).

The most recent fish population survey of Birch Creek was conducted in July 2009. LCT occupy approximately 1.9 miles of Birch Creek at an average population of 116.2 fish per mile. There were two age classes and the ratio of adult to sub-adult is 18 percent to 82 percent. The total population including young-of-year was 220.8 and all of the fish caught were considered to be in good body condition (NDOW 2009b).

Pete Hanson Creek originates south of Western Peak, on the southwest side of Cooper Peak at approximately 7,200 feet amsl in the Roberts Mountains. Pete Hanson Creek flows northwest until reaching the valley floor where it is diverted for agriculture. The first fish population survey was conducted in 1957 and subsequent surveys occurred in 1984, 1998, and 2003 (NDOW 2003b).

The first fish population survey of Pete Hanson Creek occurred in 1957. Three stations were electroshocked below a 20 to 25 foot waterfall that occurs in the upper portion of the creek.

Although no fish were found during this survey, it was estimated that there was 2.4 miles of suitable fish habitat below the waterfall. It was also noted that brook trout had been stocked in 1918 and rainbow trout in 1952. In November of 1983, 55 LCT were taken from Shoshone Creek (Big Smokey Valley Drainage) and stocked above the waterfall. The Shoshone Creek LCT had originally come from Kingston Creek (via Washington Creek of the Reese River Drainage) around 1895. In 1978, the Shoshone Creek fish were analyzed and found to be pure LCT. A more intensive habitat and fish population survey of Pete Hanson Creek conducted in 1984, found LCT at an estimated population of 184.8 fish per mile with an occupied range of one-half-mile.

In 1998, LCT occupied approximately 3.5 miles of Pete Hanson Creek with an average population of 381.7 fish per mile. The ratio of adult to sub-adult was 40 percent to 60 percent. The total population including young-of-year was 1,335.8 and the fish caught were all in good body condition (NDOW 2009b).

In 2003, LCT were found at all but the lowermost stations with an average population of 823.0 fish per mile (excluding young-of-year) and had an estimated occupied range of 3.5 miles. All fish were considered to be in fair to excellent body condition. The results of this survey are very comparable to what was found in 1998. The only difference found was in the fish per mile figures. The 1998 survey had an average of 381.7 fish per mile, while the 2003 survey had an average of 823.0 fish per mile. All other population parameters (occupied habitat, number of age classes, ratio of adult to sub-adult) were very similar. This population has occupied the majority of the available habitat in Pete Hanson Creek (NDOW 2009a). Ocular estimation of habitat conditions on the survey ranged from fair to good with the lack of quality pools and moderate amounts of sedimentation being the limiting factors (NDOW 2003b).

The most recent fish population survey of Pete Hanson Creek was conducted in July 2009. LCT occupy approximately 3.5 miles of Pete Hanson Creek at an average population of 445 fish per mile. There were five or more age classes and the ratio of adult to sub-adult is 34 percent to 66 percent. The total population including young-of-year was 1,558 and all of the fish caught were considered to be in good body condition (NDOW 2009b). When estimates are adjusted for the high rate of miss (number of fish caught was 30 and 29 were missed), the new estimates reflect 580 fish per mile and a total population estimate of 2,032.8 fish.

Willow Creek originates at approximately 7,800 feet on the north side of Roberts Mountain and flows to approximately 6,200 feet in Denay Valley, where the water is used for irrigation. Willow Creek was last surveyed by the BLM in 1984. During this survey no fish were found. Rubble and gravel sized materials were the dominant substrate and few quality pools were observed. Livestock utilization mostly occurred in the upper portions of the drainage. In 2009, a hydrologist with the BLM reported observing trout in the middle portions of Willow Creek during a PFC survey. In 2011, the NDOW conducted a survey and found LCT at survey station S7 at an average density of 105.6 fish/mile. LCT averaged 6.1 inches, with a range of 7.3 to 9.6 inches. All fish were considered to be in good to excellent body condition. While spot-shocking between stations, seven LCT were found within 200 feet upstream of survey station S6, and six LCT were found within 150 feet upstream of S7. These fish represented at least three different age classes, with one young-of-year present. The LCT population of Willow Creek appears to be healthy and has occupied a majority of the suitable habitat (NDOW 2011).

Trout Creek, Henderson Creek, and Vinini Creek are listed as possible recovery creeks for LCT in the Pine Creek subbasin (USFWS 1995). Trout Creek is located on the western flank of the Piñon Range approximately 43 miles north of the Project. Trout Creek had a remnant population of LCT in 1980; however, a subsequent survey in 1984 found only rainbow trout, brook trout, and possible hybrids. In 1999 a range fire destroyed the majority of the Trout Creek watershed and the riparian area along Trout Creek (NDOW 2004). As a result of the significant distance and separation from Trout Creek to the Project, Trout Creek is not further analyzed.

Henderson Creek has a tributary that originates in the northern portion of the Project Area (Figure 3.23.4). Henderson Creek is located approximately one mile north of the Project and originates at approximately 7,830 feet amsl. Henderson Creek flows northeast, then north where it reaches the confluences of Pine Creek at approximately 5,415 feet amsl. Vinini Creek is located approximately 2.5 miles north of the Project and originates at approximately 9,180 feet amsl. Vinini Creek flows east until it reaches the confluence of Henderson Creek at approximately 6,420 feet amsl. The most recent NDOW survey completed in Henderson Creek on June 5, 2007, found no LCT or trout.

Stream Riparian Assessment Data

Riparian assessments were conducted by the NDOW in 2001 for Birch Creek and Pete Hanson Creek to assess the riparian zones ability to dissipate stream energy, protect stream banks, and minimize erosion. Assessing the functioning condition of a stream involves qualitatively analyzing channel morphology, hydrologic, soil, and vegetative parameters to determine a rating. The rating system ranges from PFC to Functional at Risk (FAR) - Upward Trend (FAR-UP), Trend Not Apparent (FAR-NA), Downward Trend (FAR-DN), Non-Functional (NF), and Dry/Intermittent (DRY/INT). Technical Reference Series 1737 developed by the BLM, NRCS, and the USFS explains the methodology of the riparian PFC assessments. Tables 3.23-2 through 3.23-5 below summarize the riparian assessments conducted in 2001 for Birch Creek and Pete Hanson Creek.

Table 3.23-2: Stream Riparian Assessment Data from 2001 for Birch Creek

Stream Resources for Birch Creek Watershed							
Site Name	Riparian Functioning Condition Rating						Total Miles
	PFC	FAR-UP	FAR-NA	FAR-DN	NF	DRY/INT	
Birch Creek E. Trib. 1	0.00	0.00	0.00	0.44	0.00	0.00	0.44
Birch Creek R01	0.00	0.00	0.00	0.00	0.00	0.31	0.31
Birch Creek R02	0.33	0.00	0.00	0.00	0.00	0.00	0.33
Birch Creek R03	0.37	0.00	0.00	0.00	0.00	0.00	0.37
Birch Creek R04	0.00	0.00	0.00	0.00	0.00	1.92	1.92
Birch Creek R04	0.00	0.00	0.00	0.00	0.00	1.17	1.17
Birch Creek R05	0.00	0.00	0.00	0.00	0.00	0.85	0.85
Total	0.70	0.00	0.00	0.44	0.00	4.25	5.38

Table 3.23-3: Stream Riparian Assessment Data from 2001 for Birch Creek Springs

Stream Resources for Birch Creek Watershed						
Site Name	Riparian Functioning Condition Rating					Total Acres
	PFC	FAR-UP	FAR-NA	FAR-DN	NF	
Birch Creek Spring 1	0.00	0.10	0.00	0.00	0.00	0.10
Birch Creek Spring 1a	0.00	0.01	0.00	0.00	0.00	0.01
Birch Creek Spring 2	0.00	0.00	0.05	0.00	0.00	0.05
Birch Creek Spring 3	0.00	0.00	0.00	0.27	0.00	0.27
Total	0.00	0.11	0.05	0.27	0.00	0.43

Table 3.23-4: Stream Riparian Assessment Data for Pete Hanson Creek

Stream Resources for Pete Hanson Creek Watershed							
Site Name	Riparian Functioning Condition Rating						Total Miles
	PFC	FAR-UP	FAR-NA	FAR-DN	NF	DRY/INT	
Pete Hanson S. Fork (2006)	0.79	0.00	0.00	0.00	0.00	0.00	0.79
Pete Hanson S. Fork (2006)	0.90	0.00	0.00	0.00	0.00	0.00	0.90
Pete Hanson R1 (2006)	0.00	0.38	0.00	0.00	0.00	0.00	0.38
Pete Trib 2 (2008)	1.15	0.00	0.00	0.00	0.00	0.00	1.15
Pete Hanson (2009)	0.18	0.00	0.00	0.00	0.00	0.00	0.18
Pete Hanson 1 (2008)	1.75	0.00	0.00	0.00	0.00	0.00	1.75
Pete Hanson 2 (2008)	0.51	0.00	0.00	0.00	0.00	0.00	0.51
Pete Hanson 3 (2008)	0.00	1.18	0.00	0.00	0.00	0.00	1.18
Pete Hanson Creek R11	0.00	0.00	0.15	0.00	0.00	0.00	0.15
Pete Hanson Creek R12	0.00	0.00	1.19	0.00	0.00	0.00	1.19
Pete Hanson Creek R13	0.00	0.00	0.00	0.00	0.00	1.31	1.31
Total	5.28	1.56	1.34	0.00	0.00	1.31	9.49

Table 3.23-5: Stream Riparian Assessment Data from 2001 for Pete Hanson Creek Springs

Stream Resources for Pete Hanson Creek Watershed						
Site Name	Riparian Functioning Condition Rating					Total Acres
	PFC	FAR-UP	FAR-NA	FAR-DN	NF	
Pete Hanson Creek Spring Complex	0.00	0.00	0.00	1.88	0.00	1.88
Total	0.00	0.00	0.00	1.88	0.00	1.88

Stream riparian assessment data from 2001 for Birch Creek stream data indicate that of the 5.38 miles surveyed, 0.7 mile is in PFC, 0.44 mile is in a FAR-DN, and the remaining 4.25 acres was dry/intermittent. Stream riparian assessment data from 2001 for Birch Creek springs indicates that out of 0.43 acre surveyed, 0.11 acre is in a FAR-UP, 0.05 acre is classified FAR-NA, and 0.27 acre is in a FAR-DN.

Aquatic Habitat Data

Aquatic habitat surveys were conducted along with fish population surveys by the NDOW in Birch Creek and in Pete Hanson Creek in 2009 (Figure 3.23.4). A three transect aquatic habitat survey was conducted on Birch Creek on July 7 and 8, 2009, and on Pete Hanson Creek on July 6, 7, and 8, 2009 using General Aquatic Wildlife Survey (GAWS) protocol. The GAWS protocol involves capturing, measuring, and weighing native and nonnative trout. An electro-shocker is used to stun the fish so they can be netted with a large dip net. This habitat sampling was intended to capture stream conditions in the fish population sample area and was not intended to serve as a full habitat survey. Habitat transects were located at zero, 50, and 100 feet with multiple stream and habitat parameters being collected (NDOW 2009b).

Birch Creek was flowing clear and cold during the early July 2009 survey with discharge ranging from 1.02 cfs to 4.3 cfs and water temperatures ranging 55 to 61°F. Data indicate that flows experienced during the survey were higher than normal based on precipitation data from the nearest SNOTEL site on Diamond Peak. The NRCS data indicate that the 2009 water year (October 2008 to September 2009) was approximately ten percent above the 25 year average. Average station water width was 4.4 feet with an average water depth of 4.6 inches. The width to depth ratios of Birch Creek observed during the survey ranged from 6.5 to 13.8 with an average wetted ratio measurement of 12.2.

Stream habitat conditions on the surveyed portion of Birch Creek were rated from poor to good with an overall rating of good. This rating was derived by using a Habitat Condition Index (HCI) generated by the six habitat parameters of percent pool measure, percent pool structure, percent age of stream bottom, percent bank cover, percent bank soil stability, and percent bank vegetation stability. HCIs of less than 100 percent can indicate a degree of improvement or potential to increase the habitat condition of stream. These six parameters are used as indicators in determining which areas would be of greater benefit to improve a stream or stream reach (NDOW 2009b).

Overall the lack of quality pools was considered the primary limiting factor. All areas surveyed except for two had a rating of zero percent pool structure (quality pools). Pool structure is a rating of the percent of the pools in a stream or station that are class one, two, and three quality pools. Quality pools are an important component of a stream because they contribute desirable habitats for the rearing, resting, and wintering of fish. Pool measure is the rating of the pool/riffle ratio for a stream or stream reach. An optimum rating would be 100 percent. Although a pool to riffle ratio of one to one is the accepted standard for LCT, recent studies have shown that ratios that range between 0.5 to 1.5:1, tend to produce high numbers of individuals. The measured ratio for Birch Creek was 0.6:1 (38 to 62) (NDOW 2009b).

Stream bottom is a rating of the amount of gravel and rubble (preferred substrate material) at each survey station. During the Birch Creek survey, preferred substrate constituted 55.8 percent of the stream bottom (38.1 percent rubble and 17.8 percent gravel). Embeddedness averaged 31.1 percent (moderate) with values ranging from 6.7 to 66.7 percent. Elevated embeddedness of gravels by fine sediments can negatively affect LCT spawning success. Although the amount of desirable substrate (gravel and cobble) was good, the majority of desirable substrate was cemented and would be unfavorable for LCT spawning and invertebrate production (NDOW 2009b).

Bank cover for Birch Creek in the areas surveyed rated 77.1 percent with approximately 47.2 percent covered with trees, 30.6 percent covered by shrubs, and 22.2 percent of the banks covered with grasses and forbs. No exposed or barren banks were documented. Riparian species on Birch Creek consisted primarily of wild rose (*Rosa woodsii*), perennial herbaceous plants, water birch, willow, cottonwood, aspen, and chokecherry (*Prunus virginiana*). All plant species exhibited fair to excellent density and vigor. The survey protocol would consider a plant community of 100 percent shrubs as the optimum rating. Canopy densities were measured with a concave spherical densiometer. The mean canopy density for Birch Creek in the areas surveyed was 65.9 percent (NDOW 2009b).

Bank soil stability ratings are based upon the banks resiliency to impact. Incorporated in this rating is an evaluation of the associated riparian plant species root mass and depth, the bank material, assessment of raw or eroding banks, and the degree of deposition or scouring occurring in the stream bottom. Bank soil stability ratings on the surveyed areas of Birch Creek had an average rating of 73.6 percent with scores ranging from 54.2 at S6 to 83.3 at S4. Bank stream channel stability of the survey stations on Birch Creek averaged 72.7 (fair), with a range of 60 (good) to 81 (fair). Stability ratings are based on scores of zero to 38 (excellent), 39 to 76 (good), 77 to 114 (fair), and 115 and higher (poor) (NDOW 2009b).

Bank vegetation stability ratings relate to the stability generated by vegetation cover on the stream banks. The rating factors in the amount of the stream bank covered with vegetation or materials that do not allow erosion are boulders, rubble, and gravel. Bank vegetation stability ratings for the survey stations on Birch Creek ranged from 58.3 to 87.5 percent with an average of 72.2 percent. There was no current year livestock use documented at any of the survey sites (NDOW 2009b).

The major invertebrates found during the 2009 survey on Birch Creek include the following: Trichoptera; Ephemeroptera; Plecoptera; Diptera; Coleoptera; and Hirudinea). Invertebrates were common to abundant at all sites along Birch Creek (NDOW 2009b). As a result of their sensitivity to water pollution, the presence and abundance of macroinvertebrates in the Ephemeroptera, Plecoptera, and Trichoptera (common names are, respectively, mayfly, stonefly, and caddisfly) indicate good water quality. The presence of insects from these orders in Birch Creek indicates good water quality and prey base for LCT.

Pete Hanson Creek was flowing clear and cold during the July 2009 surveys with discharge ranging from 1.02 cfs to 4.3 cfs and water temperatures ranging from 46 to 59 °F. The data indicate that the flows experienced during the survey were higher than normal based on precipitation data from the nearest SNOTEL site on Diamond Peak. The NRCS data indicates that the 2009 water year (October 2008 to September 2009) was approximately ten percent above the 25 year average. The average station water width on Pete Hanson Creek was 4.4 feet with an average water depth of 5.2 inches. The width to depth ratios were determined by dividing the average station stream water widths in meters by the average station stream water depths in meters. The width to depth ratios observed during the survey ranged from 6.2 to 16.3 with an average wetted ratio measurement of 10.6 (NDOW 2009b).

Stream habitat conditions on the surveyed portion of Pete Hanson Creek were rated from poor to good with an overall rating of fair and were derived by using the HCI. Overall the lack of pools, especially quality pools, were considered the primary limiting factors. All areas surveyed except for two had less than 50 percent pool measure (Figure 3.23.4). The measured ratio for Pete

Hanson Creek was 0.2:1 (16 to 84). Of the pools measured, only two areas surveyed contained quality pools. During the Pete Hanson Creek survey preferred substrate constituted 71.4 percent of the stream bottom (27.6 percent rubble and 43.8 percent gravel). Embeddedness averaged 35.2 percent (moderate) overall with values ranging from 13.3 percent to 53.3 percent (NDOW 2009b).

Bank cover for Pete Hanson Creek rated 72.6 percent with approximately 45.2 percent of the bank coverage was composed of grasses and forbs, 35.7 percent was composed of shrubs, and 19 percent was composed of trees. No exposed or barren banks were documented. The bank cover ratings of survey stations S5, S6, and SF1 were rated at 50 percent based on the lack of shrub species and dominance of grasses. The mean canopy density was 58.6 percent (NDOW 2009b).

Bank soil stability ratings for the areas surveyed on Pete Hanson Creek averaged 74.4 percent with scores ranging from 54.2 to 83.3. Bank Stream channel stability of the survey stations on Pete Hanson Creek averaged 75.6 (fair) with a range of 61 (good) to 95 (fair). Bank vegetation stability ratings ranged from 50.0 to 83.3 percent with an average value of 70.2 percent. There was no current year livestock use documented at any of the survey sites along Pete Hanson Creek; however, evidence of past livestock damage was found at some of the survey sites (NDOW 2009b).

The major invertebrates found during the 2009 surveys include the following: Trichoptera; Ephemeroptera; Plecoptera; Diptera; Hirudinea; Gastropoda; and Hemiptera. Invertebrates were common to abundant at all survey sites along Pete Hanson Creek (NDOW 2009b).

Springsnails

Although no springsnails were observed at any of the 22 springs surveyed in July 2007, many of the springs surveyed were either dry or not flowing. Flowing springs were impacted by cattle or wild horse use (SRK 2007d). Snails were encountered at 15 of the 229 springs surveyed in September and October 2007 (SRK 2010). Snails were observed within the following hydrographic basins: Pine Valley; Diamond Valley; Huntington Valley; Kobeh Valley; and Little Smokey Valley (northern part).

Further, although snails were not observed within the ten-foot water drawdown contour (Figure 3.12.1), two streams where snails were found in the October 2007 survey are located near the predicted ten-foot drawdown boundaries. Survey site KV015 (surveyed October 4, 2007) exists generally northwest from the boundaries. Snail density was found to exceed 500 per square foot. Habitat included gravel, cobble, water cress and a flowing stream. Survey site KV065 (surveyed October 11, 2007) is located roughly southeast of the boundary. Snail density was estimated at 100 per square foot and habitat was noted as a flowing stream. Livestock sign was noted at this site.

The snails species observed during this survey were not collected for positive identification because of the destructive nature of species identification for springsnails. The NDOW identifies that the White Pine mountain snail (*Oreohelix hemphilli*), western glass snail (*Vitriina pellucida*), and the silky vallonina (*Vallonia cyclophorella*) were located in a spring approximately seven miles west of the Project Area (NDOW Public Scoping Comments, March 16, 2007).

3.23.2.2.4 Climate Change

The consequences of weather and climate change on wildlife and fisheries use can be subtle and complex. The projected changes in climate (e.g., increases in temperature, reductions in soil moisture, and more intense rainfall events) may affect habitat, composition, shifts to higher elevation/latitudes, reduced vegetation food sources, altered migration routes, less available water sources, and stream flow change impacts on migratory aquatic species (U.S. Global Change Research Program 2009).

3.23.3 Environmental Consequences and Mitigation Measures

3.23.3.1 Significance Criteria

Based upon NEPA guidelines and commonly accepted criteria, the Proposed Action or alternatives would normally be considered to have a significant effect on wildlife resources if the following occurred:

- Substantially disturbed critical wildlife habitat. Substantial disturbance would be ten percent loss of any critical wildlife species habitat in the short term, or the life of the project, and 20 percent loss cumulatively;
- Impacts to special status species, including direct or indirect disturbance of federally threatened or endangered terrestrial or aquatic wildlife species or their associated critical habitat, or disturbance of USFWS Candidate Species or BLM sensitive species in a manner and a degree that would contribute to their being listed as either federally threatened or endangered;
- Cause loss of birds or nests with eggs protected by the MBTA;
- Result in acute or chronic toxicity resulting from exposure to toxic materials in the process facilities;
- Result in wildlife risks above a threshold for chronic toxic effects from exposure to toxic materials in the pit lake;
- Result in a reduction in flow in Birch or Pete Hanson Creeks, which are identified in the Lahontan Cutthroat Recovery (LCR) Plan;
- Result in a reduction in flow in Henderson Creek or Vinini Creek, which are identified in the LCR Plan and may, in the future, play an important role as habitat for the LCT metapopulations;
- Result in a discharge or change in water quality in the Henderson Creek or Vinini Creek drainages, including ephemeral or seasonal tributaries, which results in quality that is lower than that allowed by the LCT Recovery Plan;
- **Result in a 10 dB or more increase above ambient noise levels during greater sage-grouse lekking season at leks that are located within two miles of the Project Area;** or
- Cause destruction of active bat hibernacula or maternity sites.

3.23.3.2 Assessment Methodology

Potential effects on wildlife resources are described as direct or indirect, short term (i.e., during the life of the Project) and long term. Direct impacts are those that would result in the death or injury of an animal. Indirect impacts include the degradation of wildlife habitat to the extent that population numbers decline **or individuals are displaced**. Short-term impacts are those that

could occur during implementation of the Project and until reclamation is complete. Long-term impacts are those occurring after reclamation is complete. The effects are determined to be significant or not significant based on the applicable significance criteria listed in Section 3.24.3.1.

3.23.3.3 Proposed Action

3.23.3.3.1 General Wildlife

Construction and operation of the Project would directly affect wildlife habitat through removal of vegetation in areas proposed for surface disturbance, as detailed in Section 3.9. The majority of the surface disturbance resulting from the Proposed Action would occur in the big sagebrush vegetation community. Approximately 8,355 acres of wildlife habitat would be directly removed over the 44-year mine life as a result of implementation of the Proposed Action. Due to incremental reclamation, this acreage would not be disturbed all at one time. Upon completion, the reclamation portion of the Proposed Action would be completed for 7,621 acres (91 percent of the disturbed area). Approximately 734 acres of the previous wildlife habitat in the open pit would be removed and not reclaimed, leaving a pit lake and steep rocky cliffs. Surface disturbance would be revegetated with a BLM-approved seed mix that includes native seeds or plants that are compatible with native soils located in the Project Area and includes forb and shrub species to provide forage for wildlife.

Mule deer migrate along routes from Pine Valley south around to the Roberts Mountains in to Kobeh Valley and Diamond Valley. Although it is possible that the proposed mine and well field, including the fences, roads, and human activity, may affect deer migration, it is not possible to quantify the potential impact.

Mitigation developed for water resources (Section 3.2.3), wild horses (Section 3.13.3), and special status species (Section 3.23.3.3.2) would reduce Project-related impacts to general wildlife species. These mitigation measures include the following: development of six water sites, which would increase water availability in the Project Area; **low profile pumps and cabinetry that minimize contrast with the surrounding environment**; buried pipelines that would not limit wildlife movement; fences constructed around areas of disturbance that would keep wildlife out of dangerous areas; **buried transmission lines**; **perch deterrents** on transmission lines that would decrease predation of smaller mammalian, reptilian, and avian species; electrocution prevention measures; the removal of nesting material from transmission lines and equipment that would ensure that the **perch deterrents** are effective; noise reducing enclosures or sound barriers on walls on pumps in the greater sage-grouse habitat that would also benefit other wildlife species in the area; and speed limits on Project roads that would decrease the potential of vehicular mortality of wildlife species.

- **Impact 3.23.3.3-1:** Approximately 8,355 acres of wildlife habitat would be directly removed as a result of the Proposed Action over the 44-year mine life.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

Post-reclamation wildlife habitat would differ from pre-Project habitat in vegetation compositions and age class. A portion of the Project Area would be converted from a shrub-dominated community to a grass/forb dominated community in the short term, as described in Section 3.9. Many game and nongame wildlife species may breed, forage, or roost in or near the Project Area. Potential long-term impacts to these species could include loss of nesting, brooding, roosting, foraging, and cover habitats. Once reclaimed, the vegetation that became established would, through succession, create a more shrub dominant habitat within three to five years; however, it may take 15 to 20 years to establish mature shrubs. In the short term, only seed-eating and early forb/grass-eating species such as rabbits and seed eating birds would benefit from reclamation efforts. Other game and most nongame wildlife would benefit more over time, as diversity, cover, nesting habitat potential, and forage quality increase.

- **Impact 3.23.3.3-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife in the short term.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

Noise disturbance would be continuous for approximately 44 years during implementation of the Proposed Action. Sudden loud noises such as blasts could cause wildlife to disperse in directions away from the sound. This behavior could send wildlife into unfamiliar terrain. Some wildlife may avoid the area while others may tolerate the noise and continue foraging and breeding activities in the vicinity of the Project Area.

Noise modeling indicates that an increase of 10 dB above ambient noise levels is expected at a distance of 9,800 feet from the booster pumps (Personal Communication, Jim Buntin, August 3, 2012). Two known greater sage-grouse leks located in Kobeh Valley are located within this area that would experience a 10 dB increase in noise.

- **Impact 3.23.3.3-3:** Loud and sudden noises associated with the Proposed Action could result in wildlife displacement for the life of the Project.

Significance of the Impact: The proposed Project may produce an increase greater than 10 dB above ambient noise levels, which can be detrimental to lekking greater sage-grouse. Therefore, the impact is considered significant and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.3-3:** Mitigation for noise impacts is included in Mitigation Measure 3.23.3.3-6 (as identified in the Sage Grouse Conservation Measures in Appendix D, Attachment 3) and includes noise reducing enclosures that would be installed on the Project's booster stations in Kobeh Valley as well as possible modification to the pumping regime during lekking season.

Effectiveness of Mitigation and Residual Effects: Implementation of Mitigation Measure 3.23.3.3-3 would be effective to reduce any impacts from noise to greater sage-grouse to less than significant.

The mine water supply system and the dewatering and subsequent refilling of the open pit is expected to drawdown the ground water table in an area surrounding the open pit and the Kobeh Valley Well Field. As discussed in Section 3.2.3, modeling results show that a water table drawdown of ten feet or more in the aquifer would occur in an area measuring approximately 232 square miles around the Project Area including the northern two-thirds of Kobeh Valley and the southern portion of the Roberts Mountains, from Lone Mountain to Roberts Creek Ranch, and from the 3 Bars Road in Kobeh Valley to the western Whistler Mountains.

Water sources utilized by wildlife within the ten-foot drawdown contour from Proposed Action pumping include springs within the Kobeh Valley, Diamond Valley, and Pine Valley Hydrographic Basins. As discussed in Section 3.2.3.3, there would be 22 springs, 7.7 miles of perennial streams, and **61.4 acres of riparian areas associated with these creeks** located within the ten-foot drawdown contour. Table 3.2-8 outlines the springs that would be affected. There are eight wildlife water rights associated with some of these springs that would be affected by the drawdown (Table 3.2-7). In addition, wildlife utilize stock watering sites and there are 12 water rights associated with stock watering within the ten-foot drawdown contour that would be affected by the Project activities. Impacts to water rights are discussed in detail in Section 3.2.3.3.

Game species (i.e., mule deer and pronghorn) require water year round, as needed, to satisfy physiological requirements. The reduction or loss of existing water sources could impact big game use and movements. As discussed above, relatively small big game populations currently occupy the Project Area; however, based on the mule deer habitat available within the projected ground water drawdown area, some individuals could be displaced due to the reduction of surface water and wetlands and riparian vegetation and may move into adjacent areas that are already at their carrying capacity. These displaced individuals could be lost from the population; however, this loss cannot reasonably be quantified.

A reduction in surface water and wetlands and riparian habitat would affect the amount of nesting, brooding, and foraging habitat for upland game birds (e.g., greater sage grouse, mourning dove) and denning and foraging habitat for small game mammals and furbearers. **Direct impacts to the 0.22 acre of riparian vegetation associated with the Zinc adit are expected from the Project and would affect habitat available for wildlife.** A decline in surface water availability would also impact the extent of available vegetation along portions of springs and streams. Since wetlands and riparian communities are limited within and adjacent to the Project Area, it would be difficult for displaced individuals to relocate into adequate breeding or foraging habitat in adjacent areas, as it is assumed that these habitats already would be at carrying capacity. As a result some animals could be lost from the population.

- **Impact 3.23.3.3-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

Significance of the Impact: The impact could be significant. The BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.3-4:** Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1) **that were identified for wild horses and two additional sites that would be designed specifically for wildlife use.** Although the sites shown on Figure 3.13.1 were identified as part of mitigation for wild horses (Section 3.13), development of the sites could also result in indirect beneficial impacts to wildlife species throughout the Project Area. **The locations and design of the wildlife-specific water developments would be determined by the Wildlife Working Group described in the Sage Grouse Conservation Measures in Appendix D, Attachment 3.** Additional mitigation has been proposed for wetland vegetation in Section 3.11 (Mitigation Measure 3.11.3.3-3).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.

The evaluation of the potential effects of the pit lake on terrestrial and avian wildlife was completed with the use of a SLERA. Only terrestrial and avian wildlife species were evaluated since no fish are expected to populate the pit lake. The general approach used in the preparation of the SLERA is similar to that developed by the Environmental Sciences Division and Life Sciences Division of Oak Ridge National Laboratory for the U.S. Department of Energy. In addition, the SLERA incorporated recent TRVs for certain inorganic chemical constituents derived by the EPA (SRK 2009). Together, these were used to develop species-specific toxicity criteria to which the predicted constituents in the pit water were compared.

The toxicity criteria were developed based on species-specific No Observed Adverse Effects Levels (NOAELs) and TRVs, published and calculated water ingestion rates, and average individual body weights. Criteria were developed for eight species, including the little brown bats (*Myotis lucifugus*), white-footed mouse (*Peromyscus leucopus*), cottontail rabbit (*Sylvilagus audubonii*), white-tailed deer (*Odocoileus virginianus*), red-tailed hawk (*Buteo jamaicensis*), mallard duck (*Anas platyrhynchos*), common barn owl, (*Tyto alba*) and rough-winged swallow (*Stelgidopteryx serripennis*). These species are considered reasonable surrogate species for the populations that would likely inhabit the region in and around the pit lake. A surrogate species, while not necessarily occurring in the area, typically occupies similar niches, has similar body masses, and similar exposure parameters to the known occupants of the area. For example, the white-tailed deer was selected as a substitute species for evaluation because literature data are limited on mule deer, which is a common animal in the area. This same approach holds true for the other species expected to be in the Project Area.

Protective criteria for the surrogate species are likely to be protective of local species occupying similar ecological niches at the Project Area. Additionally, it was assumed that the wildlife receptors would consume water from the pit lake and that this water would constitute 100 percent of daily water requirements for each individual species (i.e., no outside sources of water would be utilized over the life of the animal). This is considered to be a conservative assumption. On the basis of a comparison of the estimated concentrations of phosphorus in the future pit lake with general information about concentrations of nutrients expected in lakes (Horne and Goldman 1994), the pit lake is expected to be oligotrophic, i.e., to have low productivity, after the first 200 years. An oligotrophic pit lake is not expected to support significant primary productivity or development of littoral vegetation. Therefore, food web

exposures were considered incomplete for most receptor surrogates, and complete but minor for insectivorous birds and bats. Risks due to ingestion of contaminated foods by wildlife were therefore not evaluated.

- **Impact 3.23.3.3-5:** The result of the assessment for wildlife (terrestrial and avian) indicates a low risk based on calculated species-specific toxicity criteria using recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

Significance of the Impact: The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the open pit water by wildlife, the overall ecological risk of the Proposed Action is considered to be low. The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.23.3.3.2 Special Status Wildlife Species

Greater Sage-Grouse

According to NDOW's Habitat Characterization Map, there are approximately 3,544 acres of PPH and approximately 1,965 acres of PGH within the Project Area that would be permanently affected by the Project (i.e., areas that would not be available as greater sage-grouse habitat following Project reclamation).

Impacts to greater sage-grouse **as well as PPH and PGH** within and adjacent to the Project Area are expected as a result of the development of the Kobeh Valley Well Field. The well field would be located directly west and southwest of the proposed open pit mine and processing operations and could impact the movement of greater sage-grouse between Kobeh Valley and the Roberts Mountains. The proposed well field would target both the carbonate and alluvial aquifers located in Kobeh Valley. The carbonate aquifers are generally located at the foot of the Roberts Mountains in the area of Roberts, Rutabaga, and Coils Creeks. The targeted alluvial aquifers are located primarily in the northeastern quadrant of Kobeh Valley, north of Lone Mountain, to the base of the Roberts Mountains, west of Whistler Ridge and east of Coils Creek.

Impacts to greater sage-grouse as a result of the Proposed Action include the following: increased raptor or scavenger predation from elevated equipment and power poles; visual encroachment or interruptions created by elevated equipment, power poles, vehicular travel and dust; interruption of "bird foot traffic" created by above ground pipes, extended elevated berms, or other linear features that may block passage; noise created by pumps, vehicles, and equipment; collision with fences and other structures; habitat fragmentation; and unreclaimed surface disturbance resulting in habitat loss.

- **Impact 3.23.3.3-6:** Greater sage-grouse individuals **as well as approximately 3,544 acres of PPH and approximately 1,965 acres of PGH within the Project Area** could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation measures have been identified.

- **Mitigation Measure 3.23.3.3-6:** Mitigation measures are identified in the **Mount Hope Sage Grouse Conservation Measures (Appendix D, Attachment 3)**. The measures identified in this attachment include the following: conservation measures for low profile camouflaged equipment, water pipelines, transmission lines, nesting/perching maintenance, noise, perimeter fence collision prevention, seasonal restrictions, and minimization of additional disturbance; off-site mitigation; formation of a Wildlife Working Group; research; and treatment options for burial of the above-ground powerline and vegetation treatments. Additional mitigation developed for pygmy rabbits (Mitigation Measure 3.23.3.3-9) would reduce the effect to sagebrush habitat utilized by greater sage-grouse. Mitigation Measure 3.13.3.3-1 also minimizes habitat fragmentation from the wellfield pipeline.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of **conservation measures and off-site mitigation (Appendix D)**.

Migratory Birds and Raptors

Construction and operation of the Project would directly affect migratory bird and raptor habitat through removal of vegetation in areas proposed for surface disturbance, as detailed in Section 3.9.3. The majority of the surface disturbance resulting from the Proposed Action would occur in the big sagebrush vegetation community. Approximately 8,355 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of implementation of the Proposed Action. Potential impacts to breeding migratory birds from the Project would include possible direct loss of nests (e.g., crushing) or indirect effects (e.g., abandonment) from increased noise and human presence within close proximity to an active nest site. Vegetation removal would result in a reduction of breeding habitat for migratory birds in the Project Area. This acreage would not all be disturbed at one time due to incremental reclamation. Approximately 734 acres of migratory bird habitat in the vicinity of the open pit would be converted to a pit lake and steep cliffs. This conversion would increase raptor perching habitat.

Golden eagles nesting and foraging habitat are present in the Project Area. In order to avoid impacts to individual golden eagles and their nesting habitat, implementation of the environmental protection measure outlined in Section 2.2.13 for migratory birds would ensure that prior to surface disturbance a nesting survey for migratory birds (including golden eagles) would be conducted and nests avoided. Impacts to golden eagle foraging habitat would be reduced through reclamation including revegetation. Indirect impacts to golden eagles nests and habitat within ten miles of the Project could include noise and dust. These impacts are expected to last the duration of the Project and reclamation.

- **Impact 3.23.3.3-7:** Approximately 8,355 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of the Proposed Action.

Significance of the Impact: This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.3-7:** Land clearing would be conducted outside the avian breeding season, which is March 1st through August 31st for raptors and April 1st through August 1st for other migratory birds. If this is not possible, then a qualified biologist would survey the area to be cleared prior to clearing, within 14 days of disturbance. If disturbance has not occurred within 14 days of the survey, another survey would be conducted. If active nests were identified, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) was observed as a result of this survey, then a protective buffer (the size of which would depend on the requirements of the species) would be delineated and the delineated protective buffer avoided to prevent destruction or disturbance to nests until the nests were no longer active or nesting activities were no longer observed.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.
- **Impact 3.23.3.3-8:** Loud or sudden noises associated with the Proposed Action could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

Significance of the Impact: This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following **monitoring and adaptive management** mitigation have been identified.

- **Mitigation Measure 3.23.3.3-8:** All suitable golden eagle nesting habitat located within a five-mile radius of the Project Area boundary would be surveyed twice a year by a qualified biologist for the life of the Project to check the use status of golden eagle nests and habitat. If a nest is determined to be active, the nests would be monitored by video (with still images recorded every five minutes) and the recording would be reviewed by a qualified biologist once a week until the young have fledged. During the 18- to 24-month construction phase, the timing of weekly monitoring of active nests would occur from sunrise to sunset by video (with still images recorded every five minutes). During the 44-year mine life, the weekly monitoring for active nests would coincide with blasting activities. The video camera would record the nest beginning two hours before the blast and end two hours after the blast (with continuous video images recording). Annual reports would be submitted to the BLM biologist summarizing the results of the surveys. Following one year of monitoring, the qualified biologist would develop interpretable metrics to evaluate whether disturbance affects golden eagles. If there are impacts to golden eagles identified, the qualified biologist would coordinate with the BLM and USFWS to develop an adaptive management strategy to mitigate impacts for subsequent years. If a negative impact to nesting golden eagles is detected during monitoring, the BLM biologist would be contacted by electronic mail or phone by the next business day.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

Pygmy Rabbits

As shown on Figure 3.23.3, the pygmy rabbits and burrows located to the east and north of Mount Hope would be impacted by Project activities. The PAG and the LGO Stockpile would be constructed over burrows and areas where pygmy rabbits have been sighted. In addition, the Project access road and growth media stockpiles may cover burrows and areas where pygmy rabbits have been sighted. This impact would be limited to selected burrows and a limited number of individuals may be extirpated; however, this impact is not expected to result in a population-level effect that would affect the potential listing of the species under the ESA. Additionally, the BLM has calculated that approximately 475 acres of pygmy rabbit habitat would be disturbed by the Project. Of those 475 acres, 211 acres were occupied during the wildlife surveys and 264 acres are considered potential habitat.

- **Impact 3.23.3.3-9:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.3-9:** EML would fund future sagebrush habitat improvement projects in the area that would directly benefit pygmy rabbits. Based on a ratio of two acres per every acre disturbed, EML would provide 950 acres of habitat improvement projects. Projects would be selected by the Wildlife Working Group which would review greater sage-grouse habitat projects (described in Appendix D, Attachment 3). Projects that benefit both greater sage-grouse and pygmy rabbits could count toward both acreage requirements as approved by the Wildlife Working Group.
- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.

Burrowing Owls

Potential habitat for burrowing owls was identified in the Kobeh Valley portion of the Project Area. Since no burrowing owl nests were found in the Project Area, Project-related surface disturbance could result in impacts to burrowing owls by a reduction in available habitat. This reduction is unlikely to result in a reduction in population viability in the Project Area. Nest surveys implemented prior to construction (as described in Mitigation Measure 3.23.3.3-7) would ensure that no nesting activity would be affected.

Lahontan Cutthroat Trout

No direct impacts to LCT would occur as a result of implementation of the Proposed Action. Potential indirect impacts to LCT from aquifer drawdown would not be anticipated. As shown on Figure 3.23.3 the ten-foot drawdown contour would not intercept any of the springs and perennial reaches in the Birch or Pete Hanson Creeks, which are identified in the Lahontan Cutthroat Trout Species Management Plan (SMP) for the Upper Humboldt River Drainage Basin, or Willow Creek. A reduction in flow may occur in Henderson Creek, which, along with Vinini Creek, are identified in the SMP as streams that may, in the future, play an important role as habitat for the LCT metapopulations. A discharge or change in water quality could occur in the Henderson Creek drainage, including ephemeral or seasonal tributaries, which may result in water quality that is lower than that allowed by the SMP. In a memorandum dated October 19, 2011, the USFWS concurred with the determination that the Project may affect, but is not likely to adversely affect LCT.

- **Impact 3.23.3.3-10:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

Significance of the Impact: This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit to potential effects to Henderson Creek and to ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.3-10:** The mitigation measures identified in Section 3.2.3 would be sufficient to mitigate the impacts to LCT from the Proposed Action.
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since the implementation would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to **hundreds** of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.

Yellow-billed Cuckoo and Springsnails

No suitable or occupied habitat for yellow-billed cuckoos was identified in the Project Area or within the ten-foot drawdown contour; therefore, the Proposed Action is not expected to impact yellow-billed cuckoos. Although springs are located in the Project Area, there are not any springs identified that springsnails would occupy. No springsnails were located in the Project Area or within the ten-foot drawdown contour; therefore, the Proposed Action is not expected to impact springsnails. **Mitigation for impacts to surface water resources are outlined** in Section 3.2.3.

Bats

Surveys within the Project Area identified the small-footed myotis and Townsend's big-eared bat as occurring within the Project Area. Impacts to the small-footed myotis and Townsend's big-

ered bat would be the same as the impacts described above for general wildlife, which is a loss of foraging habitat.

- **Impact 3.23.3.3-11:** Bat foraging habitat would be impacted as a result of the Proposed Action over the 44-year mine life.

Significance of the Impact: This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.3-11:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix D, Attachment 4).
- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.3.3 Residual Adverse Impacts

The Proposed Action would result in the unavoidable loss of 734 acres of terrestrial wildlife habitat resulting from surface disturbance in the open pit area. Approximately 7,621 acres of wildlife habitat would be removed in the short term and then reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term. Browsers would benefit the most from the early seral stage vegetation in the short term. As the plant communities within the Project Area mature, within a period of 15 to 20 years, larger shrubs would provide additional cover for larger animals and less of a forage prey base for raptors, similar to the existing conditions.

3.23.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to wildlife would not occur. EML would continue existing activities under previously permitted Notices and the area would remain available for future mineral development or for other purposes as approved by the BLM.

3.23.3.4.1 Residual Adverse Impacts

There would be no residual adverse impacts to wildlife under the No Action Alternative.

3.23.3.5 Partial Backfill Alternative

The Partial Backfill Alternative would result in the unavoidable loss of up to 734 acres of wildlife foraging habitat resulting from surface disturbance in the open pit area. Approximately 8,148 acres of foraging habitat would be removed in the short term and then reclaimed as a result

of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term.

3.23.3.5.1 General Wildlife

Impacts to wildlife under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.5-1:** Approximately 8,355 acres of wildlife habitat would be directly removed as a result of the Proposed Action over the 44-year mine life.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

- **Impact 3.23.3.5-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife in the short term.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

- **Impact 3.23.3.5-3:** Loud and sudden noises associated with the Partial Backfill Alternative could result in wildlife displacement for the life of the Project.

Significance of the Impact: The proposed Project may produce **an increase greater than 10 dB above ambient noise levels**, which can be detrimental to **lekking** greater sage-grouse. Therefore, the impact is considered significant and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-3:** Mitigation for noise impacts is included in Mitigation Measure 3.23.3.3-6 (as identified in the Sage Grouse **Conservation Measures** in Appendix D, Attachment 3) and includes noise reducing enclosures that would be installed on the Project's booster stations in Kobeh Valley as well as possible modification to the pumping regime during lekking season.

Effectiveness of Mitigation and Residual Effects: Implementation of Mitigation Measure 3.23.3.5-3 would be effective to reduce any impacts from noise to greater sage-grouse to less than significant.

- **Impact 3.23.3.5-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

Significance of the Impact: The impact could be significant. The BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.5-4:** Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1) **that were identified for wild horses and two additional sites that would be designed specifically for wildlife use.** Although the sites shown on Figure 3.13.1 were identified as part of mitigation to wild horses (Section 3.13), development of the sites **could** also result in indirect beneficial impacts to wildlife species throughout the Project Area. **The locations and design of the wildlife-specific water developments would be determined by the Wildlife Working Group described in the Sage Grouse Conservation Measures in Appendix D, Attachment 3.** Additional mitigation has been proposed for wetland vegetation in Section 3.11 (Mitigation Measure 3.11.3.3-3).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.
- **Impact 3.23.3.5-5:** The result of the assessment for wildlife (terrestrial and avian) indicate a low risk based on calculated species-specific toxicity criteria using recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

Significance of the Impact: The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the open pit water by wildlife, the overall ecological risk of the Proposed Action is considered to be low. The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

While a permanent pit lake is not anticipated to form under the Partial Backfill Alternative, it is possible that an ephemeral pond could form on top of the backfill in the pit during times of high runoff or when ground water approaches the surface of the backfill. If this shallow water body persisted for any length of time, it could develop littoral biologic habitats. The water quality of this pond would be expected to exceed screening levels for the constituents that are elevated in pit wall runoff (Cd, fluoride, and Mn). If this pond would become permanent, it would continuously evapoconcentrate, which would create elevated levels of other constituents. Though no specific analysis is provided, the potential for a perpetual lake is assumed for this analysis and the resultant evapoconcentration in the lake would create the potential for an ecological risk to mammalian and avian species that would utilize the water.

- **Impact 3.23.3.5-6:** The development of a perpetual lake over the backfill would create a potential ecological risk to mammalian and avian species that used the lake.

Significance of the Impact: This impact is considered potentially significant with respect to those mammalian and avian species and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-6:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Water Resources - Water Quality for the Partial Backfill Alternative (Mitigation Measure 3.3.3.5-3).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation for this impact would require the removal of sufficient backfill material for the formation of an evaporative ground water sink. Implementation of this mitigation would otherwise be inconsistent with the reasoning for selecting this alternative.

3.23.3.5.2 Special Status Wildlife Species

Impacts to special status wildlife species under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.5-7:** Greater sage-grouse individuals as well as approximately 3,544 acres of PPH and approximately 1,965 acres of PGH within the Project Area could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation measure have been identified.

- **Mitigation Measure 3.23.3.5-7:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-6).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of conservation measures and off-site mitigation (Appendix D, Attachment 3).

- **Impact 3.23.3.5-8:** Approximately 8,355 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of the Proposed Action.

Significance of the Impact: This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-8:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.5-7).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.5-9:** Loud or sudden noises associated with the Partial Backfill Alternative could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

Significance of the Impact: This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.5-9:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-8).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.
- **Impact 3.23.3.5-10:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.5-10:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-9).
- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.
- **Impact 3.23.3.5-11:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

Significance of the Impact: This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit the potential effect to Henderson Creek and to ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.5-11:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-10).
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective to effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since it would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to **hundreds**

of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.

- **Impact 3.23.3.5-12:** Bat foraging habitat would be impacted as a result of the Partial Backfill Alternative for the duration of the Project.

Significance of the Impact: This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.5-12:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix D, Attachment 4).
- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.5.3 Residual Adverse Impacts

The Partial Backfill Alternative would result in the unavoidable loss of 527 acres of wildlife foraging habitat resulting from surface disturbance in the open pit area. Approximately 8,355 acres of foraging habitat would be removed over the 44-year mine life, and then all but 527 acres would be reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term, and therefore, the full 734 acres of disturbance is considered in this impact analysis.

3.23.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Although the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in approximately 20 acres less surface disturbance compared to the Proposed Action, impacts to wildlife from this alternative would be similar to those for the Proposed Action since the acreage would decrease by only 0.2 percent.

3.23.3.6.1 General Wildlife

Impacts to wildlife under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.6-1:** Approximately 8,355 acres of wildlife habitat would be directly removed as a result of the Proposed Action over the 44-year mine life.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

- **Impact 3.23.3.6-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife in the short term.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

- **Impact 3.23.3.6-3:** Loud and sudden noises associated with the Proposed Action could result in wildlife displacement for the life of the Project.

Significance of the Impact: The proposed Project may produce an increase greater than 10 dB above ambient noise levels, which can be detrimental to lekking greater sage-grouse. Therefore, the impact is considered significant and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.6-3:** Mitigation for noise impacts is included in Mitigation Measure 3.23.3.3-6 (as identified in the Sage Grouse Conservation Measures in Appendix D, Attachment 3) and includes noise reducing enclosures that would be installed on the Project's booster stations in Kobeh Valley as well as possible modification to the pumping regime during lekking season.

Effectiveness of Mitigation and Residual Effects: Implementation of Mitigation Measure 3.23.3.6-3 would be effective to reduce any impacts from noise to greater sage-grouse to less than significant.

- **Impact 3.23.3.6-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

Significance of the Impact: The impact would not be significant; however, the BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.6-4:** Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1) **that were identified for wild horses and two additional sites that would be designed specifically for wildlife use.** Although the sites shown on Figure 3.13.1 were identified as part of mitigation to wild horses (Section 3.13), development of the sites could also result in indirect beneficial impacts to wildlife species throughout the Project Area. **The locations and design of the wildlife-specific water developments would be determined by the Wildlife Working Group described in the Sage Grouse Conservation Measures in Appendix D, Attachment 3.** Additional mitigation has been proposed for wetland vegetation in Section 3.11 (Mitigation Measure 3.11.3.3-3).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.
- **Impact 3.23.3.6-5:** For wildlife (terrestrial and avian), the results of the SLERA assessment indicate a low risk based on calculated species-specific toxicity criteria using more recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

Significance of the Impact: The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the open pit water by wildlife, the overall ecological risk from the Off-Site Transfer of Concentrate for Processing Alternative is considered to be low. The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.23.3.6.2 Special Status Wildlife Species

Impacts to special status wildlife species under this alternative would be similar to the impacts described above for the Proposed Action.

- **Impact 3.23.3.6-6:** Greater sage-grouse individuals as well as approximately 3,544 acres of PPH and approximately 1,965 acres of PGH within the Project Area could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation measures have been identified.

- **Mitigation Measure 3.23.3.6-6:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-6).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.6-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of **conservation measures and off-site mitigation** (Appendix D, Attachment 3).
- **Impact 3.23.3.6-7:** Approximately 8,355 acres of migratory bird and raptor habitat would be directly removed over the 44-year mine life as a result of the Proposed Action.

Significance of the Impact: This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.6-7:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.5-7).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.
- **Impact 3.23.3.6-8:** Loud or sudden noises associated with the Off-Site Transfer of Ore Concentrate for Processing Alternative could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

Significance of the Impact: This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.6-8:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-8).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.
- **Impact 3.23.3.6-9:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.6-9:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-9).
- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.
- **Impact 3.23.3.6-10:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

Significance of the Impact: This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit the potential effect to Henderson Creek and ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.6-10:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-10).
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since it would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to **hundreds** of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.
- **Impact 3.23.3.6-11:** Bat foraging habitat would be impacted as a result of the Partial Backfill Alternative for the duration of the Project.

Significance of the Impact: This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.6-11:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix D, Attachment 4).
- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.6.3 Residual Adverse Impacts

The Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the unavoidable loss of 734 acres of wildlife foraging habitat resulting from surface disturbance in the open pit area. Approximately 8,335 acres of foraging habitat would be removed in the short term, and then 7,621 would be reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term.

3.23.3.7 Slower, Longer Project Alternative

Impacts from the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action. As discussed in Section 3.2.3, the surface area predicted to be impacted by the drawdown by this alternative is similar to, but slightly different than, the Proposed Action. The differences between the predicted drawdown area is illustrated on Figure 3.2.28. Impacts to wildlife as a result of the Slower, Longer Project

Alternative are expected to be similar to the Proposed Action at the end of the Project; **however, during the Project impacts to wildlife would be greater due to the extended duration.**

3.23.3.7.1 General Wildlife

- **Impact 3.23.3.7-1:** Approximately 8,355 acres of wildlife habitat would be directly removed as a result of the Slower, Longer Project Alternative over the extended mine life.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

- **Impact 3.23.3.7-2:** Modification of wildlife habitat and subsequent reclamation efforts would result in less available mature vegetation for cover, forage, and nesting habitat for many species of wildlife for the duration of this alternative.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

- **Impact 3.23.3.7-3:** Loud and sudden noises associated with the Slower, Longer Project Alternative could result in wildlife displacement for the life of the Project.

Significance of the Impact: The proposed Project may produce an increase greater than 10 dB above ambient noise levels, which can be detrimental to lekking greater sage-grouse. Therefore, the impact is considered significant and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.7-3:** Mitigation for noise impacts is included in Mitigation Measure 3.23.3.3-6 (as identified in the Sage Grouse Conservation Measures in Appendix D, Attachment 3) and includes noise reducing enclosures that would be installed on the Project's booster stations in Kobeh Valley as well as possible modification to the pumping regime during lekking season.

Effectiveness of Mitigation and Residual Effects: Implementation of Mitigation Measure 3.23.3.7-3 would be effective to reduce any impacts from noise to greater sage-grouse to less than significant.

- **Impact 3.23.3.7-4:** Wildlife dependent on vegetation growing near perennial streams, springs, and seeps would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area of these plants would potentially cause a decline in the wetland vegetation community and the associated wildlife species. The lowering of the water table would also potentially result in less water for wildlife consumption.

Significance of the Impact: The impact would not be significant; however, the BLM has identified the following mitigation that would benefit wildlife.

- **Mitigation Measure 3.23.3.7-4:** Mitigation for the potential loss of water would include the development of six water sites (Figure 3.13.1) **that were identified for wild horses and two additional sites that would be designed specifically for wildlife use.** Although the sites shown on Figure 3.13.1 were identified as part of mitigation to wild horses (Section 3.13), development of the sites **could** also result in indirect beneficial impacts to wildlife species throughout the Project Area. **The locations and design of the wildlife-specific water developments would be determined by the Wildlife Working Group described in the Sage Grouse Conservation Measures in Appendix D, Attachment 3.** Additional mitigation has been proposed for wetland vegetation in Section 3.11 (Mitigation Measure 3.11.3.3-3).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measures 3.11.3.3-1 and 3.23.3.3-4 would reduce impacts to the loss of riparian habitat during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the temporary loss of riparian vegetation.
- **Impact 3.23.3.7-5:** For wildlife (terrestrial and avian), the results of the SLERA assessment indicate a low risk based on calculated species-specific toxicity criteria using more recent EPA developed TRVs. None of the chemicals of potential ecological concern identified in the predicted pit lake water poses a credible risk to wildlife that may inhabit the area and use the pit lake as a drinking water source.

Significance of the Impact: The potential to adversely affect the health of terrestrial or avian life is considered negligible. Based on the predicted pit lake chemistry, calculated toxicity criteria, and predicted utilization of the Mount Hope open pit water by wildlife, the overall ecological risk from the Slower, Longer Project Alternative is considered to be low. The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.23.3.7.2 Special Status Wildlife Species

- **Impact 3.23.3.7-6:** Greater sage-grouse individuals **as well as approximately 3,544 acres of PPH and approximately 1,965 acres of PGH within the Project Area** could be impacted as a result of the Slower, Longer Project Alternative.

Significance of the Impact: This impact is considered potentially significant with respect to greater sage-grouse, a USFWS candidate species and a BLM sensitive species, and greater sage-grouse habitat and the following mitigation **measures have been identified.**

- **Mitigation Measure 3.23.3.7-6:** The mitigation measures identified in the Sage Grouse Conservation Measures (Appendix D, Attachment 3).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.6-6 would reduce impacts to greater sage-grouse during Project activities to less than significant through the implementation of **conservation measures and off-site mitigation** (Appendix D, Attachment 3).

- **Impact 3.23.3.7-7:** Approximately 8,355 acres of migratory bird and raptor habitat would be directly removed over the extended mine life as a result of the Slower, Longer Project Alternative.

Significance of the Impact: This impact is considered potentially significant with respect to vegetation removal during the avian breeding season that results in a violation of the MBTA and the following mitigation is proposed.

- **Mitigation Measure 3.23.3.7-7:** Land clearing would be conducted outside the avian breeding season. If this is not possible, then a qualified biologist would survey the area to be cleared prior to clearing. If active nests were identified, or if other evidence of nesting (mated pairs, territorial defense, carrying nesting material, transporting food) was observed as a result of this survey, then a protective buffer (the size of which would depend on the requirements of the species) would be delineated and the delineated protective buffer avoided to prevent destruction or disturbance to nests until the nests were no longer active or nesting activities were no longer observed.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-7 would reduce impacts to migratory birds during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.7-8:** Loud or sudden noises associated with the Slower, Longer Project Alternative could result in an indirect impact (i.e., disturbance) to golden eagles nesting east of the Project Area.

Significance of the Impact: This impact is considered potentially significant with respect to Project activities during the golden eagle breeding season that may result in a violation of the Bald and Golden Eagle Protection Act and the following mitigation measure has been identified.

- **Mitigation Measure 3.23.3.7-8:** Mitigation under the Slower, Longer Project Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-8).

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.23.3.3-8 would reduce impacts to golden eagles during Project activities to less than significant by ensuring no direct impacts to nesting birds would occur.

- **Impact 3.23.3.7-9:** Pygmy rabbit individuals and habitat could be impacted as a result of the Proposed Action.

Significance of the Impact: This impact is not considered significant with respect to pygmy rabbits; however, the BLM proposes the following mitigation measure.

- **Mitigation Measure 3.23.3.7-9:** Mitigation under the Slower, Longer Project Alternative would be the same as mitigation under the Proposed Action (Mitigation Measure 3.23.3.3-9).
- **Effectiveness of Mitigation and Residual Effects:** Although direct effects to pygmy rabbits and their habitat would occur in the Project Area, this mitigation would ensure additional pygmy rabbit habitat is created to replace the habitat removed at a two to one ratio.
- **Impact 3.23.3.7-10:** There may be a decrease in flows within Henderson Creek, which may affect the creek's criteria for use in LCT recovery.

Significance of the Impact: This impact is considered potentially significant with respect to a LCT recovery creek. The following mitigation has been identified by the BLM to limit to potential effects to Henderson Creek and to ensure that there would not be an effect to Birch Creek or Pete Hanson Creek.

- **Mitigation Measure 3.23.3.7-10:** The mitigation measure identified in Section 3.2.3 to ensure that the development of the ten-foot drawdown contour is consistent with the analysis in this EIS (Mitigation Measure 3.2.3.3-2a and 3.2.3.3-2b) would be sufficient to mitigate the impact to LCT from the Proposed Action.
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.2.3.3-2b and the use of any of the options outlined in Section 3.2.3 would be effective at mitigating the impacts from reduced surface water flows. The effectiveness of Mitigation Measure 3.2.3.3-2c, if implemented, is less certain since it would be many decades in the future. However, if measures used in Mitigation Measure 3.2.3.3-2b are implemented, then the measure should be effective at mitigating the impacts from reduced surface water flows. Over a long period of time (tens to **hundreds** of years) the effects to most surface water flows would diminish; however, for the springs nearest to the open pit, flows would be reduced or eliminated in perpetuity.
- **Impact 3.23.3.7-11:** Bat foraging habitat would be impacted as a result of the Slower, Longer Project Alternative for the duration of the Project.

Significance of the Impact: This impact is not considered significant; however, the following mitigation is proposed.

- **Mitigation Measure 3.23.3.7-11:** In order to minimize impacts to bat habitat, prior to the initiation of Project activities, EML would close those mine workings that would be removed over the life of the Project (after bats have been evacuated) and install bat-friendly closures on openings that would not be directly impacted by the Project in order to preserve access to the remaining bat habitat (also see Appendix D, **Attachment 4**).
- **Effectiveness of Mitigation and Residual Effects:** The protection of specific mine openings in the Project Area would be effective as mitigation for the loss of habitat associated with those mines that would be removed as a result of Project activities. Bats excluded from the closed mines in the Project Area are familiar with the mine openings that would remain accessible and would take advantage of its preservation.

3.23.3.7.3 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable loss of 734 acres of terrestrial wildlife habitat resulting from surface disturbance in the open pit area. Approximately 7,621 acres of wildlife habitat would be removed over the course of this alternative and then reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage. Browsers would benefit the most from the early seral stage vegetation immediately following reclamation. As the plant communities within the Project Area mature, larger shrubs would provide additional cover for larger animals and less of a forage prey base for raptors, similar to the existing conditions. In addition, the impacts from this alternative would create prolonged habitat disturbance on wildlife.

3.24 Transportation and Access

3.24.1 Regulatory Framework

The transportation system associated with, and in the vicinity of, the Project consists of a network of roads that are maintained by Eureka County, the NDOT, the BLM, or are existing roads on public lands that are not maintained.

Public lands under BLM jurisdiction are managed "...on the basis of multiple use and sustained yield unless otherwise specified by law" (Sec. 102 (a) (7), FLPMA). Under the FLPMA, access to public lands is generally considered open, unless the BLM RMP has designated otherwise. All public lands in the vicinity of the Project Area, except for the Roberts Mountain WSA are in an open status.

3.24.2 Affected Environment

3.24.2.1 Study Methods

The baseline data presented below is based on information from the Plan, the NDOT, and the MLFO files.

3.24.2.2 Existing Conditions

Transportation

On the eastern boundary of the Project Area SR 278 traverses the Project Area from north to south. This paved route connects the communities of Eureka and Carlin. To the south of the Project Area, the Town of Eureka is situated on U.S. Highway 50, which is one of the two-lane east-west highways that cross the US. To the north of the Project Area, the City of Carlin is situated on I-80, which is one of the major east-west four-lane interstate highways that cross the U.S. SR 278 had an average daily traffic volume in 2010 of 570 vehicle trips per day north of the Project Area in the northern portion of Pine Valley and 490 vehicle trips per day south of the Project Area near the junction with U.S. Highway 50, 175 of which were trucks in 2010 (NDOT 2011). U.S. Highway 50 had an average daily traffic volume of 1,000 vehicles, 130 of which were trucks in 2010 (NDOT 2011). Since the NDOT collected these data, the Ruby Hill Mine has added approximately 26 truck trips per day on SR 278. In 2010 there were

3.23.3.7.3 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable loss of 734 acres of terrestrial wildlife habitat resulting from surface disturbance in the open pit area. Approximately 7,621 acres of wildlife habitat would be removed over the course of this alternative and then reclaimed as a result of mine development, operation, and closure. The reclaimed land would have more grass and forb forage and less mature shrub forage. Browsers would benefit the most from the early seral stage vegetation immediately following reclamation. As the plant communities within the Project Area mature, larger shrubs would provide additional cover for larger animals and less of a forage prey base for raptors, similar to the existing conditions. In addition, the impacts from this alternative would create prolonged habitat disturbance on wildlife.

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The transportation system associated with, and in the vicinity of, the Project consists of a network of roads that are maintained by Eureka County, the NDOT, the BLM, or are existing roads on public lands that are not maintained.

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119 vehicle crashes, 28 of which involved injuries or deaths. There were seven deaths that resulted from seven crashes. Five of those crashes were non-collision crashes and none of them were head-on crashes (NDOT 2011).

Access

Primary access within Eureka County is furnished by I-80, U.S. Highway 50, SR 278, **SR 379**, county roads, and public access roads. The majority of public lands are accessible to the general public via one of these roads. I-80 and U.S. Highway 50 are the primary east-west highways in north-central Nevada. SR 278 is the main north-south corridor through Eureka County, connecting the Town of Eureka (along U.S. Highway 50) and the City of Carlin (along I-80).

The Project Area is reached from I-80 by traveling approximately 65 miles south on SR 278 along Pine Valley to Garden Pass. The Project is located on the west side of SR 278 immediately south of Garden Pass. The Project Area can also be reached from the intersection of U.S. Highway 50 by traveling north on SR 278 through Diamond Valley for approximately 23 miles. From SR 278, a number of dirt roads can be used to access the Project, which is located one mile west of SR 278.

3.24.3 Environmental Consequences

3.24.3.1 Significance Criteria

The Proposed Action would normally have a significant effect on transportation and access if the following would occur:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the roadway system; or
- Prevent or substantially reduce access to public land through the elimination of existing routes of travel.

3.24.3.2 Assessment Methodology

To evaluate impacts to transportation and access, the Proposed Action and alternatives are reviewed against existing conditions and local transportation plans. The significance criteria are then applied to determine if the adverse effects would be considered significant impacts if the Project or an alternative were implemented.

3.24.3.3 Proposed Action

The Project would employ a substantial number of personnel for administration and the **construction and** operation of mining and production equipment; however, through the use of buses to transport workers from the communities in the area (Eureka, Carlin, Elko), traffic pressure on SR 278 would be minimized. The Project would also require additional deliveries of some hazardous chemicals to the Project Area, which are discussed in Section 3.19.

Construction-related transportation would result in estimated peak traffic counts that are projected to occur in Month 10 of construction, currently expected to be September 2013. During this month, the estimated traffic would include approximately 3,600 round-trips

(trucks and commuting labor) from Eureka (and Diamond Valley), approximately 3,200 round-trips from the I-80 corridor, approximately 650 round-trips from the east on U.S. Highway 50 and approximately 400 round-trips from the west on U.S. Highway 50. On a percentage basis, this increase in traffic would be up to approximately 540 percent increase on SR 278 north of the Project Area, 700 percent on SR 278 south of the Project Area, and 150 percent increase on U.S. Highway 50. Over the 24-month construction period, the first approximately six months the traffic would be approximately ten to 25 percent of the peak volumes and the last seven months would be approximately 40 to 70 percent of the peak volumes. During this construction period the level of service on SR 278 is likely to be degraded.

During construction, materials transported to the Project site would include gravel currently stockpiled at the privately owned Romano Ranch that would be used as aggregate in concrete. The Romano Ranch is located in Diamond Valley, and aggregate would be hauled by truck approximately seven miles on the Sadler Brown gravel road to the intersection of SR 278, then north approximately three miles to the main access road.

During the construction phase of the Project a minor percentage of the construction traffic would use the Roberts Creek Road for the construction activities associated with the Project well field.

- **Impact 3.24.3.3-1:** For the 18- to 24-month construction period of the Project, there would be a peak increase in traffic from trucks, cars, pickup trucks, vans, and buses of between 150 and 700 percent over the existing traffic volumes on SR 278 and U.S. Highway 50.

Significance of the Impact: The impact is considered significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has jurisdiction over these routes. The Roberts Creek Road is a public road maintained by Eureka County and Eureka County has jurisdiction over this route. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

Operations-related transportation for the Project would result in approximately 26 daily truck trips, including the toll roasting, which would create an approximately 13 percent increase in truck traffic on SR 278. For the purpose of analysis in this EIS it is assumed the 370 employees (average number) would commute to the Project in 100 cars, six vans, and two buses, and that half the vehicles would come from the north (Carlin) and half would come from the south (Eureka). This would result in an estimated increase in non-truck traffic of between approximately 26 and 34 percent on SR 278, and an estimated increase in non-truck traffic of approximately 12 percent on U.S. Highway 50.

- **Impact 3.24.3.3-2:** For the life of the Project, which could be up to 70 years, there would be an increase in trucks (approximately 13 percent) on SR 278 and an increase in car, pickup, van, and bus traffic of between 26 and 34 percent on SR 278 and 12 percent on U.S. Highway 50.

Significance of the Impact: The impact is not considered significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has

jurisdiction over these routes. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

The public may also access the Roberts Mountains for dispersed recreation opportunities (hunting or OHV use) by using the Henderson-Roberts Creek Road, also known as the Old Pony Express Trail, which is the 1980s re-route of the original trail. This road is located on the west side of Mount Hope and traverses through Henderson Summit to connect with SR 278 approximately four miles north of Mount Hope. The designated Pony Express Trail is located on the south side of Mount Hope. Impacts of the Proposed Action on the Pony Express Trail are discussed in Section 3.21. For the life of the Project, which could be up to 70 years, access through the Project Area would be restricted.

Public access routes to areas near and beyond the Project Area would not be impacted by the Proposed Action. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project. All haul and access roads constructed by EML under the Proposed Action would be reclaimed following the completion of mining and processing. The Proposed Action would not otherwise impact access.

- **Impact 3.24.3.3-3:** For the life of the Project, which could be up to 70 years, access through the Project Area would be restricted. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project.

Significance of the Impact: This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.24.3.3.1 Residual Adverse Impacts

The Proposed Action would result in the unavoidable loss of 734 acres of public lands utilized for **wildlife habitat, wild horses and livestock grazing, dispersed recreation (including hunting)**, and mineral exploration **among other potential uses** resulting from surface disturbance associated with the open pit. There would be no residual impact to access resulting from the Proposed Action. The Proposed Action would have the unavoidable, but reversible, indirect potential to adversely affect access through the Project Area and increase use of the transportation system for the life of the Project.

3.24.3.4 No Action Alternative

Under the No Action Alternative, EML is currently authorized under **seven** Notices to disturb approximately 35 acres of public land as a result of the exploration and development of the Project. Facilities and operations that have been approved but not yet completed would have impacts on transportation and access. Public lands managed for multiple uses within the Project Area that have been proposed for surface disturbance and fencing would remain accessible.

No additional public lands would be removed from multiple use management, and impacts to land use would be limited to ongoing permitted mining and exploration activities. There would be no impacts to access beyond existing conditions resulting from the approved Notices.

3.24.3.4.1 Residual Adverse Impacts

There would be no residual impacts to transportation and access under the No Action Alternative, other than those impacts caused by authorized Notice-level operations at the Project. The impacts to access caused by existing operations at the Project are considered temporary, and no residual adverse impacts are anticipated.

3.24.3.5 Partial Backfill Alternative

The Project would employ a substantial number of personnel for administration and the **construction and** operation of mining and production equipment; however, through the use of buses to transport workers from the communities in the area (Eureka, Carlin, Elko), traffic pressure to SR 278 would be minimized. The Project would also require additional deliveries of some hazardous chemicals to the Project Area, which are discussed in Section 3.20.

Construction-related transportation would result in estimated peak traffic counts that are projected to occur in Month 10 of construction, currently expected to be September 2013. During this month, the estimated traffic would include approximately 3,600 round-trips (trucks and commuting labor) from Eureka (and Diamond Valley), approximately 3,200 round-trips from the I-80 corridor, approximately 650 round-trips from the east on U.S. Highway 50 and approximately 400 round-trips from the west on U.S. Highway 50. On a percentage basis, this increase in traffic would be up to approximately 540 percent increase on SR 278 north of the Project Area, 700 percent on SR 278 south of the Project Area, and 150 percent increase on U.S. Highway 50. Over the 24-month construction period, the first approximately six month the traffic would be approximately ten to 25 percent of the peak volumes and the last seven months would be approximately 40 to 70 percent of the peak volumes. During this construction period the level of service on SR 278 is likely to be degraded.

During the construction phase of the Project a minor percentage of the construction traffic would use the Roberts Creek Road for the construction activities associated with the Project well field.

During construction, materials transported to the Project site would include gravel currently stockpiled at the privately owned Romano Ranch that would be used as aggregate in concrete. The Romano Ranch is located in Diamond Valley, and aggregate would be hauled by truck approximately seven miles on the Sadler Brown gravel road to the intersection of SR 278, then north approximately three miles to the main access road.

- **Impact 3.24.3.5-1: For the 18- to 24-month construction period of the Project, there would be a peak increase in traffic from trucks, cars, pickup trucks, vans, and buses of between 150 and 700 percent over the existing traffic volumes on SR 278 and U.S. Highway 50.**

Significance of the Impact: The impact is considered significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has jurisdiction over these routes. The Roberts Creek Road is a public road maintained by Eureka County and Eureka County has jurisdiction over this route. It is beyond

the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

Operations-related transportation for the Project would result in approximately 26 daily truck trips, including the toll roasting, which would create an approximately 13 percent increase in truck traffic. For the purpose of analysis in this EIS it is assumed the 370 employees (average number) would commute to the Project in 100 cars, six vans, and two buses, and that half the vehicles would come from the north (Carlin) and half would come from the south (Eureka). This would result in an estimated increase in non-truck traffic of between approximately 26 and 34 percent on SR 278, and an estimated increase in non-truck traffic of approximately 12 percent on U.S. Highway 50.

- **Impact 3.24.3.5-2:** For the life of the Project, which could be up to 70 years, there would be an increase in trucks (approximately 13 percent) on SR 278 and an increase in car, pickup, van, and bus traffic of between 26 and 34 percent on SR 278 and 12 percent on U.S. Highway 50.

Significance of the Impact: This impact is not considered less than significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has jurisdiction over these routes. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

The public may also access the Roberts Mountains for dispersed recreation opportunities (hunting or OHV use) by using the Henderson-Roberts Creek Road, also known as the Old Pony Express Trail, which is the 1980s re-route of the original trail. This road is located on west side of Mount Hope and traverses through Henderson Summit to connect with SR 278 approximately four miles north of Mount Hope. The designated Pony Express Trail is located on the south side of Mount Hope. Impacts of the Proposed Action on the Pony Express Trail are discussed in Section 3.21. For the life of the Project, which could be up to 70 years, access through the Project Area would be restricted.

Public access routes to areas near and beyond the Project Area would not be impacted by the Proposed Action. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project. All other haul and access roads constructed by EML under the Proposed Action would be reclaimed following the completion of mining. The Partial Backfill Alternative would not otherwise impact access.

- **Impact 3.24.3.5-3:** For the life of the Project, which could be up to 70 years, access through the Project Area would be restricted. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project.

Significance of the Impact: This impact is considered less than significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.24.3.5.1 Residual Adverse Impacts

The Partial Backfill Alternative would result in the unavoidable loss of 734 acres of public lands utilized for **wildlife habitat, wild horses and livestock grazing, dispersed recreation (including hunting), and mineral exploration among other potential uses** resulting from surface disturbance of the open pit area. There would be no residual adverse impact to access resulting from the Partial Backfill Alternative. Similar to the Proposed Action, the Partial Backfill Alternative would have the unavoidable indirect potential to adversely affect access through the Project Area for the duration of the Project.

3.24.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

The Project would employ a substantial number of personnel for administration and the **construction and** operation of mining and production equipment; however, through the use of buses to transport workers from the communities in the area (Eureka, Carlin, Elko), traffic pressure to SR 278 would be minimized. The Project would also require additional deliveries of some hazardous chemicals to the Project Area, which are discussed in Section 3.20.

Construction-related transportation would result in estimated peak traffic counts that are projected to occur in Month 10 of construction, currently expected to be September 2013. During this month, the estimated traffic would include approximately 3,600 round-trips (trucks and commuting labor) from Eureka (and Diamond Valley), approximately 3,200 round-trips from the I-80 corridor, approximately 650 round-trips from the east on U.S. Highway 50 and approximately 400 round-trips from the west on U.S. Highway 50. On a percentage basis, this increase in traffic would be up to approximately 540 percent increase on SR 278 north of the Project Area, 700 percent on SR 278 south of the Project Area, and 150 percent increase on U.S. Highway 50. Over the 24-month construction period, the first approximately six month the traffic would be approximately ten to 25 percent of the peak volumes and the last seven months would be approximately 40 to 70 percent of the peak volumes. During this construction period the level of service on SR 278 is likely to be degraded.

During the construction phase of the Project a minor percentage of the construction traffic would use the Roberts Creek Road for the construction activities associated with the Project well field.

During construction, materials transported to the Project site would include gravel currently stockpiled at the privately owned Romano Ranch that would be used as aggregate in concrete. The Romano Ranch is located in Diamond Valley, and aggregate would be hauled by truck approximately seven miles on the Sadler Brown gravel road to the intersection of SR 278, then north approximately three miles to the main access road.

- **Impact 3.24.3.6-1: For the 18- to 24-month construction period of the Project, there would be a peak increase in traffic from trucks, cars, pickup trucks, vans, and buses of between 150 and 700 percent over the existing traffic volumes on SR 278 and U.S. Highway 50.**

Significance of the Impact: The impact is considered significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has

jurisdiction over these routes. The Roberts Creek Road is a public road maintained by Eureka County and Eureka County has jurisdiction over this route. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

Operations-related transportation for the Project would result in approximately 26 daily truck trips, including the toll roasting, which would create an approximately 13 percent increase in truck traffic. For the purpose of analysis in this EIS it is assumed the 370 employees (average number) would commute to the Project in 100 cars, six vans, and two buses, and that half the vehicles would come from the north (Carlin) and half would come from the south (Eureka). This would result in an estimated increase in non-truck traffic of between approximately 26 and 34 percent on SR 278, and an estimated increase in non-truck traffic of approximately 12 percent on U.S. Highway 50.

- **Impact 3.24.3.6-2:** For the life of the Project, which could be up to 70 years, there would be an increase in trucks (approximately 13 percent) on SR 278 and an increase in car, pickup, van, and bus traffic of between 26 and 34 percent on SR 278 and 12 percent on U.S. Highway 50.

Significance of the Impact: This impact is considered less than significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has jurisdiction over these routes. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads (see Section 3.26 of this EIS).

The public may also access the Roberts Mountains for dispersed recreation opportunities (hunting or OHV use) by using the Henderson-Roberts Creek Road, also known as the Old Pony Express Trail, which is the 1980s re-route of the original trail. This road is located on the west side of Mount Hope and traverses through Henderson Summit to connect with SR 278 approximately four miles north of Mount Hope. The designated Pony Express Trail is located on the south side of Mount Hope. Impacts of the Off-Site Transfer of Ore Concentrate for Processing Alternative on the Pony Express Trail are discussed in Section 3.21. For the life of the Project, which could be up to 70 years, access through the Project Area would be restricted.

Public access routes to areas near and beyond the Project Area would not be impacted by the Off-Site Transfer of Ore Concentrate for Processing Alternative. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project. All other haul and access roads constructed by EML under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be reclaimed following the completion of mining. The Off-Site Transfer of Ore Concentrate for Processing Alternative would not otherwise impact access.

- **Impact 3.24.3.6-3:** For the life of the Project, which could be up to 70 years, access through the Project Area would be restricted. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project.

Significance of the Impact: This impact is considered less than significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.24.3.6.1 Residual Adverse Impacts

The Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the unavoidable loss of 734 acres of public lands utilized for **wildlife habitat, wild horses and livestock grazing, dispersed recreation (including hunting), and mineral exploration among other potential uses** resulting from surface disturbance of the open pit area. There would be no residual adverse impact to access resulting from the Off-Site Transfer of Ore Concentrate for Processing Alternative. Similar to the Proposed Action, the Off-Site Transfer of Ore Concentrate for Processing Alternative would have the unavoidable indirect potential to adversely affect access through the Project Area for the duration of the Project.

3.24.3.7 Slower, Longer Project Alternative

The Project would employ a substantial number of personnel for administration and the **construction and** operation of mining and production equipment; however, through the use of buses to transport workers from the communities in the area (Eureka, Carlin, Elko), traffic pressure to SR 278 would be minimized. The Project would also require additional deliveries of some hazardous chemicals to the Project Area, which are further discussed in Section 3.20.

Construction-related transportation would result in estimated peak traffic counts that are projected to occur in Month 10 of construction, currently expected to be September 2013. During this month, the estimated traffic would include approximately 3,600 round-trips (trucks and commuting labor) from Eureka (and Diamond Valley), approximately 3,200 round-trips from the I-80 corridor, approximately 650 round-trips from the east on U.S. Highway 50 and approximately 400 round-trips from the west on U.S. Highway 50. On a percentage basis, this increase in traffic would be up to approximately 540 percent increase on SR 278 north of the Project Area, 700 percent on SR 278 south of the Project Area, and 150 percent increase on U.S. Highway 50. Over the 24-month construction period, the first approximately six month the traffic would be approximately ten to 25 percent of the peak volumes and the last seven months would be approximately 40 to 70 percent of the peak volumes. During this construction period the level of service on SR 278 is likely to be degraded.

During the construction phase of the Project a minor percentage of the construction traffic would use the Roberts Creek Road for the construction activities associated with the Project well field.

During construction, materials transported to the Project site would include gravel currently stockpiled at the privately owned Romano Ranch that would be used as aggregate in concrete. The Romano Ranch is located in Diamond Valley, and aggregate would be hauled by truck approximately seven miles on the Sadler Brown gravel road to the intersection of SR 278, then north approximately three miles to the main access road.

- **Impact 3.24.3.7-1: For the 18- to 24-month construction period of the Project, there would be a peak increase in traffic from trucks, cars, pickup trucks, vans, and buses**

of between 150 and 700 percent over the existing traffic volumes on SR 278 and U.S. Highway 50.

Significance of the Impact: The impact is considered significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has jurisdiction over these routes. The Roberts Creek Road is a public road maintained by Eureka County and Eureka County has jurisdiction over this route. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

Operations-related transportation for the Project would result in approximately 13 daily truck trips, including the toll roasting, which would create an approximately six percent increase in truck traffic. For the purpose of analysis in this EIS it is assumed the 260 employees (average number), under the Slower, Longer Project Alternative, would commute to the Project in 70 cars, four vans, and two buses, and that half the vehicles would come from the north (Carlin) and half would come from the south (Eureka). This would result in an estimated increase in non-truck traffic of between approximately 18 and 23 percent on SR 278, and an estimated increase in non-truck traffic of approximately six percent on U.S. Highway 50.

- **Impact 3.24.3.7-2:** For the life of the Project, which could be up to 114 years, there would be an increase in trucks (approximately six percent) on SR 278 and an increase in car, pickup, van, and bus traffic of between 18 and 23 percent on SR 278 and six percent on U.S. Highway 50.

Significance of the Impact: This impact is considered less than significant. SR 278 and U.S. Highway 50 are public roads that are maintained by the NDOT, and the NDOT has jurisdiction over these routes. It is beyond the BLM's jurisdiction to impose mitigation measures for activities on these public roads. See Section 3.26 of this EIS.

The public may also access the Roberts Mountains for dispersed recreation opportunities (hunting or OHV use) by using the Henderson-Roberts Creek Road, also known as the Old Pony Express Trail, which is the 1980s re-route of the original trail. This road is located on the west side of Mount Hope and traverses through Henderson Summit to connect with SR 278 approximately four miles north of Mount Hope. The designated Pony Express Trail is located on the south side of Mount Hope. Impacts of the Slower, Longer Project Alternative on the Pony Express Trail are discussed in Section 3.21. For the life of the Project, which could be up to twice as long (Approximately 115 years) as the Proposed Action, access through the Project Area would be restricted.

Public access routes to areas near and beyond the Project Area would not be impacted by the Slower, Longer Project Alternative. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project. All other haul and access roads constructed by EML under the Slower, Longer Project Alternative would be reclaimed following the completion of mining. The Slower, Longer Project Alternative would not otherwise impact access.

- **Impact 3.24.3.7-3:** For the life of the Project, which could be up to twice as long (approximately 115 years) as the Proposed Action, access through the Project Area would

be restricted. Public access to surrounding areas would remain available throughout the construction, mining, and reclamation phases of the Project.

Significance of the Impact: This impact is considered less than significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.24.3.7.1 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable loss of 734 acres of public lands utilized for **wildlife habitat, wild horses and** livestock grazing, **dispersed recreation (including hunting),** and mineral exploration **among other potential uses** resulting from surface disturbance associated with the open pit. There would be no residual impact to access resulting from the Slower, Longer Project Alternative. This alternative would have the unavoidable, but reversible, indirect potential to adversely affect access through the Project Area for the life of the Project.

3.25 Forest Products

3.25.1 Regulatory Framework

The 43 CFR 5400 regulates the sale of forest products harvested from public lands.

3.25.2 Affected Environment

Study Methods

The NRCS soil surveys were reviewed to obtain existing vegetation data for the area and potential natural vegetation and ecological site descriptions (SRK 2007b). A gross scale mapping effort of the vegetation in the majority of the Project was conducted by aerial survey (helicopter) on April 28, 2006, and ground surveys (SRK 2007b). UTM coordinates were obtained for boundaries between plant communities. An additional survey for biological resources, including vegetation, was conducted on July 1 and 2, 2008 (Great Basin Ecology 2008). The BLM provided information of the known woodland product harvesting in the Project Area.

3.25.2.1 Existing Conditions

Singleleaf piñon and Utah juniper woodlands provide the majority of the forest products occurring in the BLM MLFO area. Piñon-juniper woodlands are currently located in the northern, central, and southeastern portions of the proposed mine area. Forest products come from the following activities in the Project Area: pine nut harvesting; fence posts; fuel wood (e.g., greenwood and dead wood); and Christmas tree cutting. Approximately 12,795 acres of vegetation containing a singleleaf piñon and Utah juniper component are located in the Project Area (Table 3.9-1). Forest product harvesting is not permitted in WSAs.

3.25.2.1.1 Greenwood Cutting

Personal greenwood cutting can occur where cutting of live trees is permitted. Commercial greenwood cutting is allowed on a case-by-case basis by the BLM. The most common uses of greenwood cutting products are fence posts and fuel wood. Commercial fuel wood harvesting can occur in the vicinity of the Project Area.

3.25.2.1.2 Pine Nut Harvest

The public can collect up to 25 pounds of piñon pine nuts each year with no cost or permit being required. A permit is required to collect more than 25 pounds annually. The majority of public lands administered by the BLM are open to the general public for pine nut collection. All pine nuts that are intended for resale require a permit/contract with the BLM. The Nevada BLM has designated commercial sale areas which are advertised for sale each year in August. The Project is located within the Whistler/Sulfur Springs and Roberts Commercial Pine Nut Sale Areas (Figure 3.25.1).

3.25.2.1.3 Christmas Tree Cutting

Christmas tree cutting occurs in the vicinity of the Project Area. Christmas tree permits are available from the BMDO. Piñon pine and Utah juniper are the only trees that can be cut on BLM-administered lands in Nevada. Christmas trees may be cut anywhere on BLM land within the BMDO boundaries except in WSAs. Commercial Christmas tree harvesting can occur in the vicinity of the Project Area.

3.25.3 Environmental Consequences and Mitigation Measures

The environmental consequences of the Proposed Action and each alternative as they relate to forestry products are discussed in this section.

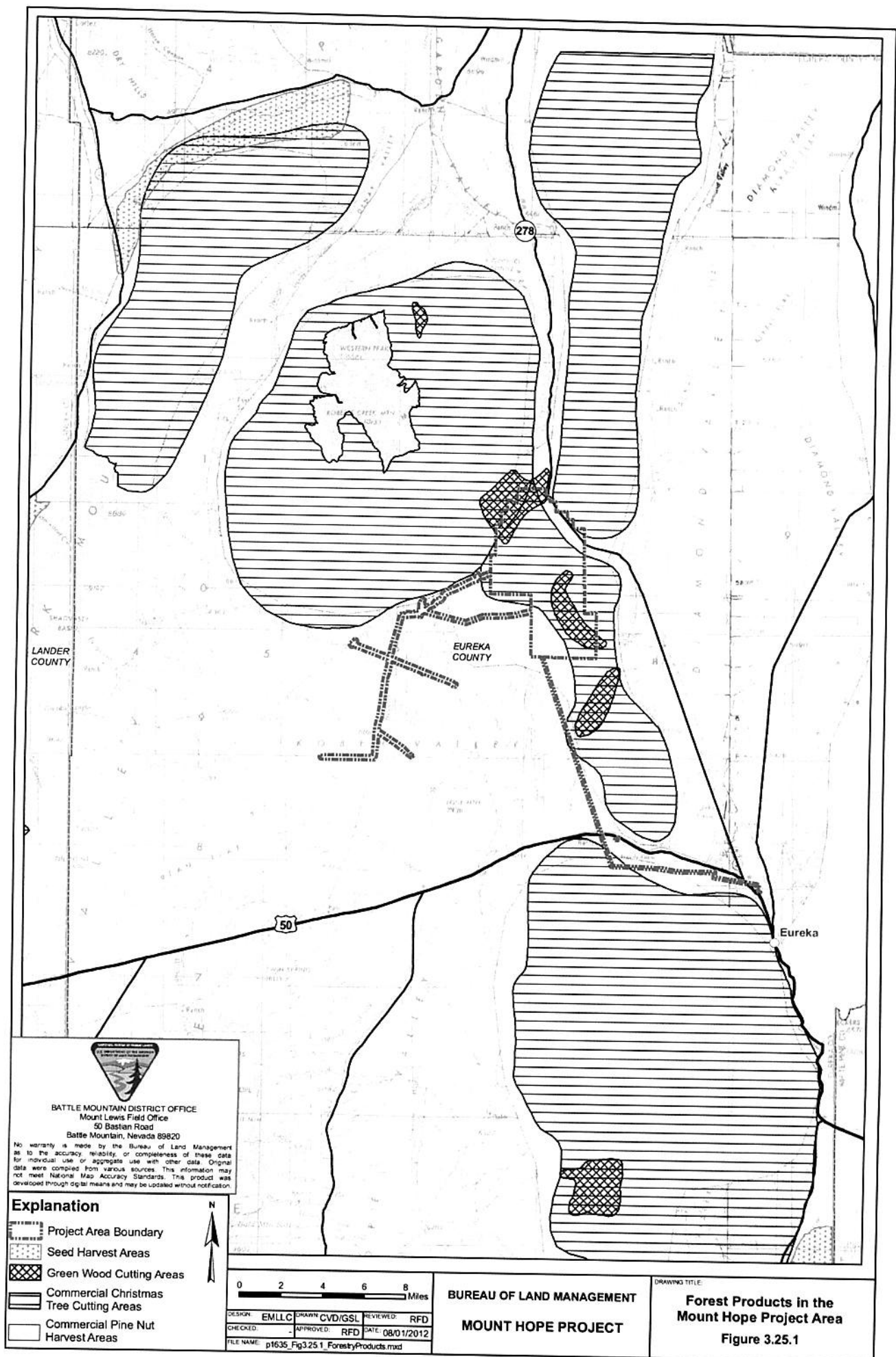
3.25.3.1 Significance Criteria

Based upon NEPA guidelines and commonly accepted criteria, the Proposed Action or alternatives would normally be considered to have a significant effect on forestry products if the following occurred:

- Substantially affect greenwood cutting, pine nut harvesting, or Christmas tree cutting; or
- Area is somehow rendered unsuitable for traditional use.

3.25.3.2 Assessment Methodology

Potential effects on forestry products can be categorized as direct and indirect, as well as short term (i.e., during the life of the Project) and long term. Direct effects on forestry products would include temporary and permanent loss of singleleaf piñon and Utah juniper associated with construction, operation, and maintenance of the Project. Indirect effects could include degradation of habitat due to trampling, soil compaction, water table decline, spills, increased access, and introduction of noxious weeds. Short-term impacts are those that could occur during Project implementation and until reclamation is complete. Long-term impacts are those occurring



after reclamation is complete. The effects are determined to be significant or not significant based on the applicable significance criteria listed in Section 3.25.3.1.

3.25.3.3 Proposed Action

Implementation of the Proposed Action would result in the temporary disturbance of 8,355 acres of vegetation over the 44-year mine life. Approximately 3,296 acres of vegetation with a singleleaf piñon component would be impacted by the Proposed Action within the Project Area (Table 3.9-4).

The Proposed Action would result in the conversion of tree- and shrub-dominated vegetation types in the Project Area to grass/forb-dominated vegetation types following reclamation. Over the long term, shrubs and trees would become reestablished and increase in abundance within the majority of disturbed areas as a result of reclamation and natural recolonization. Due to timing of the Project development and concurrent reclamation, the total acreage of vegetation disturbed would not occur all at one time. Upon completion of the Project, the reclamation portion of the Proposed Action would be completed for 7,621 acres (91 percent of the disturbed area). Approximately 734 acres of vegetation in the vicinity of the open pit would be removed and not reclaimed.

The removal of 3,296 acres of singleleaf piñon and Utah juniper trees would be a long-term impact, since it would take approximately 75 to 100 years for mature woodland to become reestablished in the disturbance areas. Of the 3,296 acres of total disturbance in piñon-juniper vegetation, approximately 734 acres of piñon-juniper woodland would be permanently lost due to the development of the open pit. The long-term change in vegetation and loss of woodland productivity would not result in significant impacts to woodland products since the Proposed Action is located in an area where abundant singleleaf piñon and Utah juniper exist on public lands.

Reclamation and revegetation would minimize the aforementioned impacts to vegetation. A total of 7,621 acres (or 91 percent of the disturbed area) would eventually be revegetated. Only the 734 acres of the open pit would remain unvegetated. Revegetation activities would be conducted as outlined in Section 2.1.17. Reclamation seed mixtures and application rates, based on BLM requirements, are shown in Tables 2.1-9 and 2.1-10.

- **Impact 3.25.3.3-1:** Disturbance or removal of 3,296 acres of vegetation with a singleleaf piñon and Utah juniper component would occur as a result of the Proposed Action.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.25.3.3.1 Residual Adverse Impacts

Residual adverse impacts to forestry products would include the permanent loss of vegetative productivity from approximately 734 acres of land associated with the open pit that would not be reclaimed and a long-term change in vegetation composition (i.e., tree and shrub dominated

communities to grass and forb dominated communities) as a result of Project development and operation.

Residual adverse impacts to woodland products would result from the long-term loss of approximately 3,296 acres of vegetation communities containing a singleleaf piñon and Utah juniper component on BLM administered land. Woodland products from these areas would not be available until mature trees had become reestablished, which would take approximately 75 to 100 years. Of the 3,296 acres of total disturbance in vegetation with a singleleaf piñon and Utah juniper component, approximately 734 acres of singleleaf piñon and Utah juniper would be permanently lost with the development of the open pit.

3.25.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to forestry products would not occur. EML would continue existing activities under previously permitted Notices, and the area would remain available for future mineral development or for other purposes as approved by the BLM. Under the No Action Alternative, EML would continue to conduct mineral exploration and data acquisition within the Project Area. Ongoing reclamation would help to minimize impacts to vegetation through continuation of current and ongoing activities, with resulting short-term impacts to herbaceous species and long-term impacts to woody species.

- **Impact 3.25.3.4-1: Implementation of the No Action Alternative would result in the removal of vegetation including forest products.**

Significance of the Impact: The impact is not considered significant.

3.25.3.4.1 Residual Adverse Impacts

The No Action Alternative would have the unavoidable long-term impacts to piñon-juniper as part of surface disturbance associated with permitted exploration and data acquisition; however, revegetation and reclamation would minimize these impacts to forestry products.

3.25.3.5 Partial Backfill Alternative

Impacts to forestry products would be similar to those described for the Proposed Action; however, the Partial Backfill Alternative would involve the partial backfilling of the open pit to eliminate the pit lake and the floor of the open pit would be reclaimed using growth media and then seeded. Although the Proposed Action would have 734 acres that would remain unvegetated in the open pit, under this alternative approximately 527 acres would remain unvegetated following Project completion and reclamation; therefore, impacts to forestry products would be similar to, but slightly less than, those described for the Proposed Action.

- **Impact 3.25.3.5-1: Disturbance or removal of 3,296 acres of vegetation with a singleleaf piñon and Utah juniper component would occur as a result of the Proposed Action.**

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.25.3.5.1 Residual Adverse Impacts

Residual adverse effects to forestry products would include the permanent loss of vegetative productivity from approximately 527 acres of land associated with the open pit that would not be reclaimed and a long-term change in vegetation composition (i.e., tree and shrub dominated communities to grass and forb dominated communities) as a result of Project development and operation.

Residual impacts to woodland products would result from the long-term loss of approximately 3,296 acres of vegetation communities with a singleleaf piñon and Utah juniper component on BLM-administered land. Woodland products from these areas would not be available until mature trees had become reestablished, which would take approximately 75 to 100 years. Of the 3,296 acres of total disturbance in singleleaf piñon and Utah juniper, approximately 527 acres of singleleaf piñon and Utah juniper would be permanently lost with the development of the open pit.

3.25.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Although the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in approximately 20 acres less surface disturbance when compared to the Proposed Action, impacts to vegetation community types from this alternative would be similar to those for the Proposed Action since the disturbance acreage would decrease by only 0.2 percent.

- **Impact 3.25.3.6-1:** Disturbance or removal of 3,296 acres of vegetation with a singleleaf piñon and Utah juniper component would occur as a result of the Proposed Action.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.25.3.6.1 Residual Adverse Impacts

The potential residual impacts to forestry products from the Off-Site Transfer of Ore Concentrate for Processing Alternative would be similar to those for the Proposed Action.

3.25.3.7 Slower, Longer Project Alternative

Impacts to forestry products from the Slower, Longer Project Alternative are expected to be similar to impacts from the Proposed Action at the end of the Project; however, impacts from the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action.

- **Impact 3.25.3.7-1:** Disturbance or removal of 3,296 acres of vegetation with a singleleaf piñon and Utah juniper component would occur as a result of the Proposed Action.

Significance of the Impact: The impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.25.3.7.1 Residual Adverse Impacts

Residual adverse impacts to forestry products would include the permanent loss of vegetative productivity from approximately 734 acres of land associated with the open pit that would not be reclaimed and a long-term change in vegetation composition (i.e., tree and shrub dominated communities to grass and forb dominated communities) as a result of Project development and operation.

Residual adverse impacts to woodland products would result from the long-term loss of approximately 3,296 acres of vegetation communities containing a singleleaf piñon and Utah juniper component on BLM administered land. Woodland products from these areas would not be available until mature trees had become reestablished, which would be longer compared to the Proposed Action because of the increased duration of this alternative. Of the 3,296 acres of total disturbance in vegetation with a singleleaf piñon and Utah juniper component, approximately 734 acres of singleleaf piñon and Utah juniper would be permanently lost with the development of the open pit.

3.26 Proposed Mitigation Measures Outside the BLM's Jurisdiction

As outlined in guidance from the CEQ (and echoed in the BLM NEPA Handbook) in an EIS, all "relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or cooperating agencies, and thus would not be committed as part of the RODs of these agencies" (CEQ, Forty Most Asked Questions Concerning the CEQ's NEPA Regulations, March 23, 1981, Question 19b). The BLM acknowledges that it has no regulatory authority to require or implement mitigation outside of its jurisdiction. However, in an effort to inform and alert other agencies that can or may be able to implement the mitigation, the BLM has identified suggested mitigation measures that are outside of the BLM's jurisdiction but could be applied to reduce or eliminate the effects of the Proposed Action or the action alternatives. These potential mitigation measures are outlined in this section. In addition, the following text identifies the regulatory agency responsible for implementing this mitigation, if one exists, as well as some discussion on the probability of the mitigation being implemented.

3.26.1 Water Rights

Potential additional mitigation for impacts to water rights is similar to the water resource mitigation outlined in Sections 3.2 and 3.3 of the EIS which would require EML to mitigate impacts to water rights as a result of Project activities. This mitigation may include, but not be limited to, the following: changing and/or discontinuing the pumping regime; drilling a new water well for an impacted water right holder; or paying the affected water right